The Iron Age

A Review of the Hardware and Metal Trades.

Published every Thursday Morning by DAVID WILLIAMS, No. 10 Warren Street, New York.

Vol. XVI: No. 5. *New York, Thursday, July 29, 1875.* *$4·50 a Year, Including Postage. Single Copies, Ten Cents.*

Universal Hand Planing and Shaping Machine.

Generally, the accurate forming of small pieces of metal for special purposes has been left to the file, and the accuracy of the work depended entirely upon the skill of the workman. True surfaces, except to the skillful workman, are difficult to make, and except in large shops where milling machines were to be found little attempt has been made to do small work nicely. Model makers and men having small planers are commonly called upon whenever it is necessary to do any small or fine work. There has been a long felt want by all thoughtful mechanics for a hand machine, to use at the vise bench, for the large range of work that can more readily be performed on such a machine than by any other tool; a machine with which the apprentice or cheap hand can do the work that would require the most skilled and close workman with the cold chisel and file. The Universal Hand Planing and Shaping Machine is the result of an attempt to meet this want, and give the mechanic a tool which shall be as available on small work as the file, while possessing the accuracy of the milling tool and the planer. It is a machine at once portable, adapted to the uses of mines, mills, etc., and readily adjusted to the work itself, such as shafting, architectural work, large bars of iron and steel, and on machinery where the parts are too large, or so shaped that the ordinary planer will not take them on. The planer not only reduces very much the cost of the labor performed at the vise bench, but earns its cost price in a short time in the reduction of the file bills. The value of the file is in the sharpness of its cutting powers; these once dulled and the grooves filled with soft metal, grease and dirt, the file is useless. The use of the file at the vise bench requires the greatest skill of eye and hand, and hence, the highest price of labor. As the tool which this high priced labor uses steadily deteriorates with each minute's use, the work performed each hour is lessened and the cost of each hour's work increased; the best file is nearly all waste, but not so with the cutters of the planer—once dulled it goes for a moment to the grindstone and comes back new.

Figure 1 shows the universal hand planer with vise. The tool head B, is similar to that used in ordinary small planers. It has a vertical motion of from 1¼ to 2¼ inches according to the size of the machine; this is given by the small hand wheel on top. The stroke across the work is given by the handle and the wheel A. The tool head or holder is carried on a rod or cylinder which is held in the clamps *c*, *c*; when these are loosened, the tool head may be set at any angle or revolved through a complete circle. When these clamps are screwed down tight, the head is held in any desired position. The mortise across the work or "feed" is automatic or by hand just as may be desired. The hand wheel on the left of Fig. 1, gives this motion. Fig. 2 shows the automatic arrangement, which is so arranged as to feed either way, or to be inoperative whenever desired, so as to feed by hand. At D, the machine may be raised or lowered, and on this bearing the whole of the upper part of the machine swings in a horizontal direction. The cylinder E, and its clamp give another variety of motions, while F, held in the clamp G, completes the list of motions necessary to give the head a "universal" motion. The vise is made by Charles Parker, expressly for the planer, the clamp G, being cast upon the side of the jaw. The parts D, E, F, are all of the same size and interchangeable. A small bracket table fits upon E, and rests upon O, between the jaws of the vise, for holding small work.

Figure 2, shows the planer mounted upon a universal stand. At the joint D, it is raised or lowered, the other parts of the stand aiding in making the motion universal. The chuck S, which holds the work, rotates on its center, and can also be raised or lowered. In this cut the lever is set in the opposite of the working position. Figure 3 shows the planer mounted upon a universal stand. Here the work done can be at any angle, but in one plane only. The advantage of the arrangement is that the feed is always parallel with the chuck that holds the work. In order to give the planer the greatest variety in its applications a bracket clamp, Fig. 4, is provided, by which the work can be attached to shafting, bars of iron and used in a great many places otherwise inaccessible. The planer is manufactured by the Old Colony Rivet Works, 34 Warren street, New York. We have used one of these planers on several occasions, and found that we could do work with it that could not be done in any other way, and all the work was better than we could do with a file under any circumstances whatever. In speed of operation it secured all that could be desired, while it was accurate and very convenient.

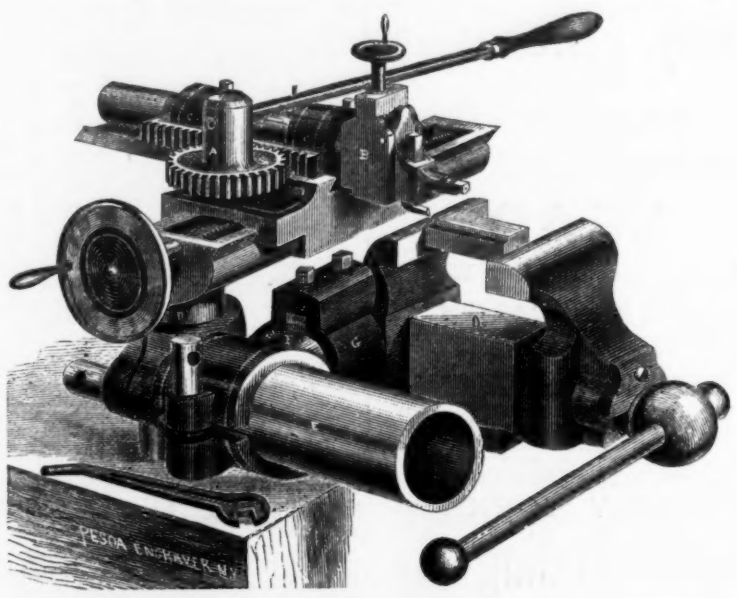


Fig. 1.—UNIVERSAL HAND PLANER WITH VISE.



Fig. 4.—BRACKET CLAMP.

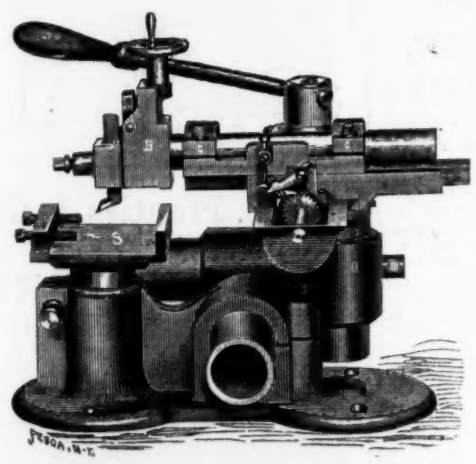


Fig. 2.—THE PLANER WITH UNIVERSAL STAND.

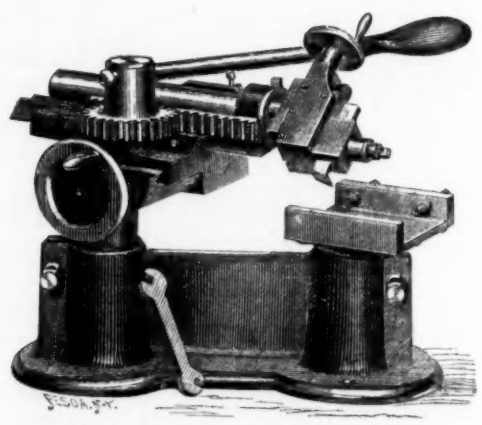


Fig. 3.—THE PLANER WITH PLAIN STAND.

Carr patents a process for the manufacture of a cheap and indestructible artificial stone. He finds that a mixture of fat lime slaked to powder with clay reduced to an impalpable powder by calcination at a cherry-red heat, when subjected to a high pressure, has the property of hardening rapidly under water, and exhibits a degree of durability proportionate to the pressure it has undergone.

How Our Coins are Made.

To those who remember with satisfaction the days of gold and silver currency, it will be a pleasure to know that the mints are still busy making coins. A correspondent of the *Tribune* sends the following account of the processes employed at the San Francisco mint: Until recently a small percentage, I believe one fifth of one per cent., has been charged for coining, but the Forty-Third Congress repealed the tax on coinage, which is a source of rejoicing on the part of dealers in bullion. We will say that Smith owns a quantity of gold dust and a few bars of silver. The fineness of neither has been ascertained, but Smith is in need of money and wants to realize. He takes his gold and silver to the mint and becomes what is known as a depositor. He deposits his metals, which are weighed in his presence to a hundredth part of an ounce, and receives a receipt for the number of ounces, but no value is given, for it has not yet been ascertained. The deposit is numbered, a memorandum made, which accompanies the deposit wherever it goes, and it is placed in a sheet iron box and conveyed to the deposit melting room. A record is here made, and in its turn the deposit is melted to a white liquid state in a black lead crucible, the process requiring about half an hour. The deposit is then run into a mold, and the bar thus formed is stamped with its number, and sent back to the place of its original reception. The grains are placed in a paper and accompany the bar, and both are weighed again to ascertain the loss in melting. The bar is then sent to the assayer, where its fineness is ascertained, and the deposit is returned to the superintendent. Upon the fineness of the bar the value of the deposit is computed, and Smith is paid by a gold check on the treasurer, without being obliged to wait for a week or two until his deposit can be put into coin. The bar is then turned over to the melter and refiner, with a number of other deposits, which are melted into what are known as unparted bars, weighing from 300 to 400 ounces each, and these are sent to the assayer and assayed in turn, thence going to the refinery for the removal of silver and base metals contained, and are in due time returned to the superintendent of the mint in the form of refined and nearly pure gold. The gold is again assayed and turned over to the melter and refiner to be made into ingots. Copper is used as alloy in the proportion of nine of gold to one of copper, the standard of American coin being ·900 fine. To ascertain the amount of copper to be added, the gross weight is multiplied by the fineness of the gold and divided by 900, which gives the number of standard ounces, or, in other words, what it would weigh if ·900 fine. The difference between the gross and standard weights is the amount of copper to be added. The "melts," as they are then termed, are sent to the ingot furnaces where they are melted and run into ingot molds, where the metal hardens instantly. The ingots are then placed into a pickel tub containing a solution of sulphuric acid, which removes the impurities on the surface, and a trifling proportion of copper. The first and last ingots in each melt, which are reserved for assaying, are chipped at either end before pickling. From the pickle the ingots are cooled in a tank of water. At one end of each ingot is a hollow place like that in the bottom of a glass bottle caused by the air in the bottom of the mold, and this end is topped off in a machine. The bars are then filed to remove the rough edges, and each "melt" is placed in a separate box and goes to the weighing room, and is weighed.

It must be said that the melter and refiner, owing to his responsibility, is very careful of the precious metal in his keeping. After the bars are in his possession for weighing, all the pots are scraped, the tops and fillings collected, the iron floor, in open work pieces, is taken up and washed, the stone floor, swept and cleaned around the furnaces, and the metal separted from the remains, weighed and placed to the credit of the melter. There must of necessity be a loss in the coinage of money owing to the number of processes through which it has to pass, and an allowance by law is made to the weigher and refiner. The loss by act of Congress in the entire process of melting, from first to last, is fixed at 1 oz. to every 1000 oz. of gold, and 1½ oz. to every 1000 oz. of silver. This was supposed to be about the ordinary wastage. Mr. Martin, however, has shown that the allowance is too great, although in his case it makes no difference to the government. In some of the mints, however, the practice has been to return none of the allowance to the government, and I have heard that it was only necessary to be superintendent of a certain mint for a year or two to accumulate a handsome fortune on a salary of $3000 or $4000 a year. Mr. Martin, since he has been in office, has done his part of the business of coining with less loss than was ever known before. He took charge of the melting and refining department on Oct. 17, 1874, and a settlement with him was had on June 30, 1875. The total value of the bullion worked during that time was $48,052,903·76. On this the legal wastage or limits was $52,229·67. His loss on gold was $545·26, and on silver he had an excess of $371·66. The net loss, therefore, was only $173·60, and the government was saved $52,056·07. A "melt" of gold contains about 2950 ounces, and of silver about 1600. The ingots, when ready for the coiner, are for $20 gold pieces 12½ inches long, 1½ inches wide and one-half inch thick; for eagles, half and quarter eagles, for half dollars, dimes, &c., the bars vary according to the size and thickness of the coin. The coiner takes these ingots, or bars, and runs them between two heavy cylinders, which reduces the large gold and silver bars to strips 3½ feet long, 1½ inches wide and quarter inch thick. They are then taken to the annealing furnace and placed in long copper pipes and heated to a cherry color, then cooled in a tank of water, then broken down again, and their usually handsome in appearance and immense in size. It is used exclusively on double eagles, and happened to be at work. With one motion of the machine the coin was struck on both sides, and the file edge placed around it, and so perfect is its working that the only sound heard was the clicking and jingling of the perfect coin as they fell, about 60 a minute, into the sheet iron box beneath. Its motions are not unlike those of a printing press, but its power may be imagined when it is contrasted with the latter, which prints on paper while the former embosses on metal. The blank coins are placed in an upright tube connected with the press, and a pair of agile iron fingers slip one coin at a time from the bottom and push it under the stamp which contains the die for one side of the coin, the reverse being on the "bed." The lever comes down with a force that would crush railroad iron, and yet without noise, and the same agile fingers that push the blank coin under the stamp push the finished coin out. This press weighs 18,000 pounds, and cost a dollar for every pound. Its name is Ajax. When the coin is finished, it is delivered to the Treasurer in bulk, uncounted. It is, however, weighed, and has to be accurate to the weight of a grain. The coin is not counted until it is paid out over the counter. The deliveries to the Treasurer are termed drafts, and after weighing each draft it is put in a canvas sack by itself and stowed away in the Treasurer's vault, to be paid out on checks and find its way into circulation through the various channels of finance and trade.

Dr. Linderman has not yet decided at what point he will recommend the location of the new mint authorized by the last Congress. There is a lively scramble for it on behalf of St. Louis, Chicago, Omaha, Kansas City and Denver. The chances seem rather in favor of Chicago.

An English Strong Room.

The London *Daily News* gives the following description of the new premises of the Safe Deposit Company in Bucklersbury, London: The building, roughly speaking, is divided into two divisions—namely, office and safe. There are in the building four tiers of safes, and, as tenders to them, four tiers of offices. These two divisions are separated by a brick wall 3 feet thick, through which there is only one entrance on each floor, such entrance being a massive corrugated iron door that has stood the test of two days' fire without flinching. The "safe" division of the building contains 32 distinct chambers, and each chamber contains many hundreds of compartments, great and small, for the deposit of papers, &c. The walls of this gigantic safe are composed of 3 feet of the hardest blue Staffordshire brick, with an exterior of fire bricks, and inside there is an armor plating 4 inches thick, cast on a wrought iron gridiron, that is calculated to make entrance doubly impossible. Around this parent safe there is a clearly defined passage, which will be patrolled night and day. To each department of this gigantic repository there is a door composed of 12 inches in thickness of solid steel, slid into grooves by hydraulic machinery, and behind which there is a perpetual pressure of 160 tons. These doors are composed of steel so tempered that the greatest expert who could be found in the country after drilling vigorously for a week found that he had progressed only half an inch, and retired disheartened. To guard against nefarious entrance to the premises by boring from below, there is, as a final floor to the building, a tank of eight feet of water, to reach which an enterprising burglar would have to engineer his way through 15 feet of concrete, for the mere pleasure of finding himself drowned like a rat in a hole. The water in this tank is used for a variety of purposes, being ultimately sent with a rush to the top of the building. The steam, engines, boilers, and all the machinery are in duplicate; so that, one set failing the concern will not be brought to a standstill.

Surveying Instruments.—The interesting statement is made by a surveyor who, for some four years, has used the telemeter on the coast and in the interior of Alaska, that no instrument could have given more satisfactory results, it being found that, by means of it, the surveys could be depended on as being almost accurate—in some cases much more so than if measured with the chain or tape. On rocky shores the telemeter was found invaluable, and in a few months he was able, with the assistance of a common sailor as rodman, to make surveys that, by the ordinary methods, would have required fully five years to complete. He discovered after a time that, for correct results, an accurate focus was necessary, and to every observation the following correction or error in measurement was to be added, namely: To the distance of the eye-piece from the object-glass add the distance of the object-glass from the diaphragm, which in the case of the instrument employed was exactly one foot.

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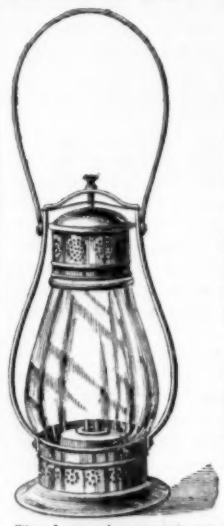
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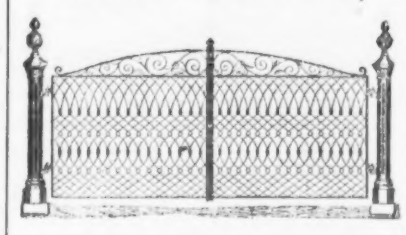
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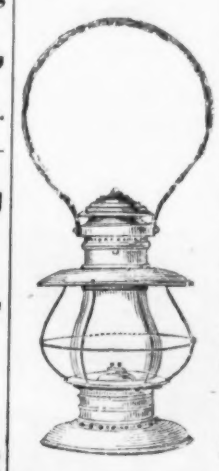
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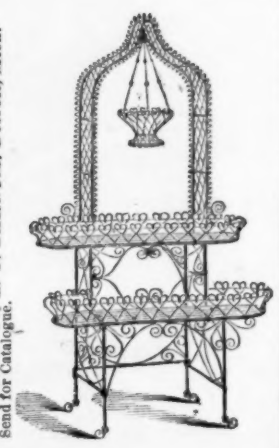


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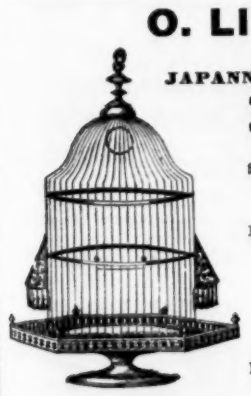
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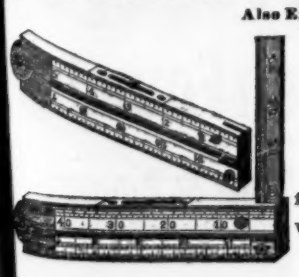
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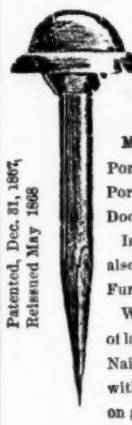
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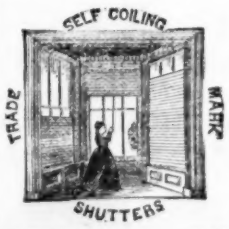
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Spongy Iron.

At a recent meeting of the Newcastle-upon-Tyne Chemical Society, held in the theatre of the College of Physical Science, Mr. J. Pattinson, the president, in the chair, Mr. Gibb read a paper on "Spongy Iron."

Spongy iron, or iron sponge—the slightly cohering mass resulting when iron ores are reduced below the welding heat of iron, said the author—is produced in nearly all iron smelting processes, although it is a form of iron but little known in practice. Many proposals have been made to separate iron smelting into the two distinct operations of reduction to sponge, and the subsequent welding or melting of this product to produce malleable iron, steel, or cast iron. The earliest attempts on a large scale were those of Clay, under patents obtained in 1837 and 1840, and he has been followed by a series of inventors, of whom Chenot conducted the most elaborate recorded experiments. Efforts in this direction still continue; two processes, having for object respectively the manufacture of puddle bar and steel, being now carried on on a somewhat large experimental scale; and lately a series of extensive experiments were made by Siemens, with specially planned furnaces that certainly reduced the ore to sponge, and smelted the latter successfully so far as economy of working was concerned. But iron as sponge is in a most favorable condition for absorbing sulphur from the reducing agent and from furnace gases—a drawback that compelled Siemens to abandon this method of working.

Although the separate production of spongy iron, for the manufacture of iron, does not give workable promise, the fine state of division of the metal in the iron sponge renders it very suitable for the precipitation of copper from solutions produced in the extraction of copper from its ores by the wet method.

For the use of spongy iron, in the reduction of sulphides, &c., in the dry way, Bronac and Deherrypon obtained a patent in 1859, and later in the same year Gossage patented the use of spongy iron, reduced from burnt pyrites in ovens or muffle furnaces, for the precipitation of copper from solution. In 1862 Bischof patented the manufacture and application of spongy iron for copper precipitation, his process and raw material being essentially the same as those described in Gossage's patent three years earlier. In 1863 Bischof patented an arrangement of reverberatory furnace and accessory apparatus, for the production of spongy iron for use in precipitation and other purposes. Henderson, in 1863 and 1867, patented a variety of furnaces, and in 1869 Suelus patented a furnace similar to Gerstenhofers' pyrites kiln, for the production of spongy iron, but no one of their devices has been adopted. Proposals patented later than Bischof's have had, for main object, the production of sponge for the manufacture of iron and steel. Most of these have been some form of retort or muffle furnace in which the mixture is heated by transmission through brickwork, the retorts being horizontal or vertical. This method is slow in action, and the wear and tear of the brickwork has proved too great in practice. Suelus' furnace, in which the finely ground material falls from one series of bars to another in a reducing atmosphere, whilst maintained at a red heat, appears well adapted for the production of sponge, but its introduction being proposed for the manufacture of steel, the liability of iron in this state to absorb sulphur from furnace gases would probably prevent its adoption.

Siemens' cylindrical revolving furnace, although well adapted for quick and economical reduction, was abandoned for this reason. The vertical retort furnace has been again proposed by Blair, who states that he has overcome the former difficulties of working this class of furnace. In a vertical retort externally heated, unless the width be impracticably small, an excessive time is required for heating the mass through. Blair employs a shaft about 4 feet in diameter, and by the device of a cylinder suspended in the throat, and leaving an annular space only 3 or 4 inches wide, and heated internally by gas at the same time that the external shaft is kept heated, the ore enters the body of the furnace at a red heat, which is then readily maintainable in the mass. The reduced iron, passing down into a cooling shaft, is withdrawn from time to time, whilst fresh ore and charcoal are charged into the annular mouth.

Only one form of furnace is now employed in making iron for precipitation. This is essentially a reverberatory furnace 30 feet long, with provision for conveying the flame under the hearth after it has passed over the charge. The hearth of the furnace is 23 feet long and 8 feet wide, and is divided into three working beds by bridges. Each bed has two working doors on one side. The doors slide in grooves and close air-tight. The fire is 4 feet by 3 feet, with bars 4 feet 8 inches below the bridge, thus allowing for a considerable depth of burning fuel. The fire door slides in grooves like the working doors. The hearth is formed of tiles sustained on brick-work partitions, forming flues through which the flame returns after passing over the hearth. From these flues the flame drops, by a vertical flue alongside the fire bridge, to an underground flue communicating with a chimney. The entrance to the latter flue is provided with a fire tile damper, which is closed whenever the working or fire doors of the furnace have to be opened. A cast iron pan, 20 feet by 10 feet, is carried by short columns and girders over the furnace roofs. In this pan the ore is dried and mixed with coal, and from it is charged into the hearth through cast iron pipes built into the furnace arch. The furnace is elevated on brick pillars, to allow of iron cases running under it to receive the reduced iron, and it is worked from a platform of cast iron plates. A vertical pipe, 6 inches diameter, passes through the hearth of the furnace, inside each working door, and through these pipes the reduced iron is discharged into iron cases placed beneath. These cases are horizontally rectangular, and taper upward on all sides. The cover is fixed, and in its center is a hole 6 inches diameter, with a flange upward, which serves to connect the case with the discharging pipe. The bottom of the case is closed by a folding door, hinged on one side, and secured by bolts and cutters on the other. The case is fitted with four wheels, clear of the door, and is covered with a cast iron plate, fitting loosely into the opening on the upper side. It stands 4 feet 8 inches high, and has a capacity of 12 cubic feet.

The furnace being at a bright red heat, each of the three working beds is charged, with 20 cwt. of dry purple ore and 6 cwt. ground coal, from the cast iron pan over the roof. The fire and working doors are closed, and the only air entering is that through the fire, in working which care is taken to prevent the mass of burning fuel getting hollow. The charge in the first bed from the fire bridge is reduced in from 9 to 12 hours; in the second, in 18 hours; and in the third, in about 24 hours. Each charge is stirred over two or three times during the period of reduction. Before opening any door the flue damper is closed, to prevent a current of air entering over the charge. On the complete reduction of the charge, on any working bed, two cases are run under the bottom pipe, to which their mouths are luted by clay, and the charge is quickly drawn into them, by rakes worked through the doors. The cases are then removed and closed with cast iron plates. In about 48 hours the iron is cooled sufficiently to be discharged, and this is simply done by raising the case by a crane, and knocking out the cutters fastening the hinged door, on the bottom, when from the tapering form of the case the mass of reduced iron falls out readily. The sponge is ground to powder under a pair of heavy edge stones, 6 feet in diameter, and is passed through a sieve of 50 holes per lineal inch.

For the manufacture of spongy iron for precipitation, two materials have been proposed, viz., burnt pyrites and "purple ore." The following are analyses of the materials:

	Burnt Ore.	Purple Ore.
Ferric oxide	78·15	95·10
Iron	3·76	—
Copper	1·55	·18
Sulphur	3·62	·07
Cupric oxide	2·70	—
Zinc oxide	·47	—
Lead oxide	·84	·96
Calcium oxide	·28	·20
Sodium oxide	—	·13
Sulphuric acid	5·80	·78
Arsenic acid	·25	—
Silicious residue	1·85	2·13
Total	99·27	99·55

Bischof and Gossage both proposed the use of burnt ore on the ground of the obvious economical advantage that the copper it contains is obtained, with the precipitated copper, without the expense of extraction. But burnt ore contains a notable proportion of arsenic—·16 per cent. in above analysis—and this metal, remaining in the sponge, if left mixed with the precipitated copper, and seriously deteriorates the quality of the refined copper ultimately made from it. Bischof states that* "should the ore have contained traces of metals, such as arsenic or lead, they will be volatilized during the process of reduction." Whilst lead is reduced and in a great measure volatilized in the spongy iron furnace, the arsenic in such ores being present mainly as arseniates of copper and iron, which are likely to be reduced to fixed arsenes, is not volatilized, spongy iron made from burnt ores containing a proportion of arsenic closely agreeing with that in the ore. "Purple ore," which retains only the most minute trace of arsenic, is the only material now employed, and the following analysis gives the composition of spongy iron, made from purple ore by means of the furnace and method described above: Ferric oxide, 8·15 per cent.; ferrous oxide, 2·40; metallic iron, 70·40; copper, ·53; lead, ·27; carbon, 7·60; sulphur, 1·07; alumina, ·19; zinc, ·30; silicious residue, 9·00; total, 99·62 per cent.

In using spongy iron in precipitating copper, the liquids are agitated by an air blast whilst the iron is gradually added. By this means a very perfect mixture is obtained, and a copper precipitate can be readily produced, containing not more than 1 per cent. of metallic iron. As compared with precipitation by scrap iron, the economy of space required and facility of manipulation are very great. On the side of spongy iron precipitation are cheapness of material and economy of application, whilst against it is the presence with the precipitated copper of the unreduced iron oxides and excess of carbon from the reduction. In employing spongy iron, the copper extractor has the production of the precipitant in his own hands, and avoids the troublesome handling of a material so cumbrous as scrap iron

As regards the chemistry of spongy iron precipitation, it is, of course, identical with that of scrap iron precipitation, and although it is stated by Bischof that,* "some substances, such as arsenic especially, are only precipitated after the iron has been in contact with the solutions containing copper and these substances for several hours. The precipitation of the copper by my process being finished in a much shorter time, and the solutions then being separated from the iron powder, the above substances cannot be precipitated or mixed with the precipitated copper," the writer has been unable, with iron in any form, or with copper solutions in any state, to completely precipitate copper, and leave any, even the smallest, proportion of arsenic in solution.

In the screw mill at Holyoke, Mass., a new "header" has been placed, having a capacity of 120 screws per minute, or 30 per cent. more than the swiftest one previously used, and increasing the capacity of that department about 50 per cent. The new "header" runs on the smaller sizes, which will increase the assortment manufactured. Fifteen new "threaders" have also lately been started, and more are to be added.

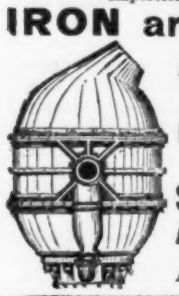
* Patent No. 1695, of 1862.

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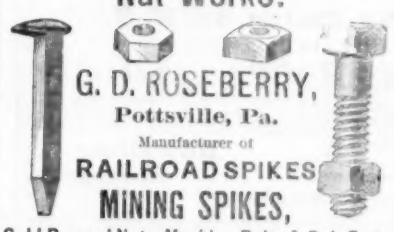
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New Patents.

We take from the records of the Patent Office in Washington the following specifications of certain patents lately issued, which will be found interesting:

IMPROVEMENT IN METALLURGIC FURNACES.

Specification forming part of Letters Patent No. 163,795, dated May 25, 1875, issued to Theophilus D. Morgan, of Pittsburgh, Pa.:

Figure 1 is a longitudinal vertical section of the improved metallurgic furnace, as formed by a plane passing through *x x*, Fig. 2. Fig. 2 is longitudinal horizontal sectional view, as formed by a plane along the line *x' x'* Fig. 1.

At B is shown the operating chamber of a metallurgic furnace, which, so far as the purposes of the present invention are concerned, may be of any desired form or construction, with reference to its use in roasting, calcining, heating, reheating, melting, puddling, boiling, or otherwise treating metals, metallic alloys, or compounds by heat. At D is shown the ordinary stack. The neck P of the furnace, intermediate between the flue bridge *b* and the stack D, is preferably made a little longer than in the ordinary puddling furnace—say, from 12 to 15 feet in length, more or less—though the length may be varied at pleasure with reference to its heating capacity. The hight of its flues inside is made from two to three feet, and their width about six inches, more or less. This neck P is divided into a series of flues, of which at least one, *a*, leads from any suitable connection with

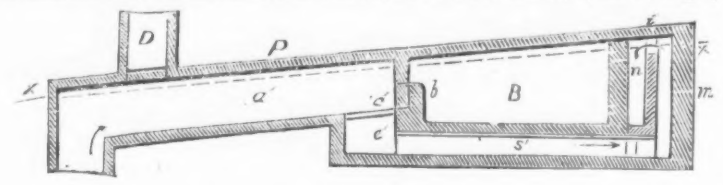


Fig. 1.—IMPROVED METALURGIC FURNACE.

a gas generator, producer, or holder, at outside of, or near the stack, and opens, by a diving flue, *c*, into a chamber, *e*. Another flue, a^1, receives atmospheric air at the stack end, and conducts such air along, and by a diving flue, *c'*, discharges it into the chamber, *e'*. Alternately arranged with the flues *a* a_1 are the smoke flues a^2, leading to the stack. The heated smoke or gases, or other products of combustion, passing back through the flues a^2, will heat the inclosing walls so as thereby to heat the gas and air passing forward along the flues *a* a^1. From the chamber *e* the gas passes along a flue, or a series of flues, *s*, under the furnace bed or operating chamber B, where it is still further heated, and in like manner the air from the chamber *e'* is conducted along a like flue or series of flues, *s'*, and is heated in like manner. At the front or opposite end of the furnace are two up-take flues, *m n*, each extending across, or nearly across, the entire front end, and into one, *n*, the gas flues *s* discharge, and into the other, *m*, the air flues *s'* open in like manner. The heated air passes up the up-take flue *m*, and through a series of ports, *i i*, at or near the upper end of the separating wall, into the upper part of the up-take flue *n*, where it comes in contact, and is intermingled with heated gas arising in said flue. The two intermixed pass through a series of ports, *o*, in the upper part of the bridge wall, and being now heated to the point of combustion, ignite, and act in the operating chamber B in the usual manner.

Instead of the series of ports *i* and *o*, a single broad opening at the upper end of each wall may be employed.

The invention is not limited to any particular number of flues for each of the purposes designated, as the number may be increased or diminished without departing from the scope of the invention.

The furnace is to have the necessary charging and tapping holes or other appliances, but which for clearness of illustration has been omitted in the drawing.

The furnace described, beside embodying the elements of utility commonly belonging to furnaces of this class, is cheaply made, as the building of the flues requires only straight brick work of the simplest kind.

Claim.—1. The neck of the ordinary metallurgic furnace, divided into alternately arranged air, gas, and smoke flues *a* a^1 a^2, the air and gas flues taking air and gas at the stack end of the neck.

2. The air and gas flues *a* a^1, arranged in the neck, alternately with the smoke flues, and taking air and gas at the stack end of the neck, in combination with the flues *s s'* under the bed of the furnace, and up-take flues *m n*, with their discharge ports alternately arranged.

3. A system of gas and air flues, *a* a^1 *s s'*, in combination with the up-take flues *m n* and operating chamber B, whereby the air and gas are heated, mixed and ignited.

IMPROVEMENT IN COMPOSITIONS FOR LINING FURNACES.

Specification forming part of Letters Patent No. 163,345, dated May 18, 1875, issued to Charles Edward Wilson, of New York, N. Y.

This invention relates to compounds of a refractory nature employed in coating or daubing furnaces or cupolas, upon the top of fire bricks therein, and coating plumbago crucibles and ladle stoppers, or in manufacturing crucibles and ladle stoppers, where the composition is subjected to great heat, and it is necessary to secure the greatest refracting quality; and it consists in a composition formed by mixing asbestos with plumbago and kaolin or good fire-clay, or any clay of a refractory nature, which, when ground together and diluted with water until it has attained about the consistency of mortar, will form a composition of great refractory and non-heat-conducting power.

To prepare the composition, take about forty parts of pulverized asbestos; ground plumbago, about twenty parts; ground kaolin, fire clay, or any refractory clay, about forty parts. The asbestos and plumbago is then thoroughly mixed together. Next add a sufficient quantity of water to the clay to make it about the consistency of thick cream. The whole, to wit, the asbestos, plumbago and clay water, is then thoroughly mixed together, when the mass should assume the consistency of plaster or mortar. The quantity of water added to the clay should be such as to attain this result. The composition is then adapted to be applied as a lining, coating, or to be molded. After it has been thus used it should be thoroughly dried, when it will be ready to be subjected to the heat required in the art in which it is employed.

The particular object of the invention is to add to the wearing power of plumbago crucibles as now manufactured, which are made of a composition consisting of plumbago, fire sand and clay, by applying a coating or lining of this composition over the entire exterior or interior surface, or both, of such crucibles after they are worn thin and otherwise weakened and reduced in heat-bearing powers by repeated melts or heats in a furnace. This composition being a powerful non-conductor of heat, renders the crucible so lined or coated with it nearly equal to a new one in its working powers.

While it is designed especially to use this composition in coating and lining plumbago crucibles, it will be seen that it may also be used in coating or daubing furnaces or cupolas upon the fire brick therein, and coating plumbago crucibles, or in manufacturing crucibles and ladle stoppers. It will also be seen that this composition may be used to manufacture bricks that would take the place of the ordinary fire bricks. It may also be used to coat pipes of any kind when it may be desirable to prevent the radiation of heat.

The asbestos is a more powerful non-conductor of heat than any material heretofore used for a similar purpose, and this combined with plumbago and fire clay, both non-conductors of heat, forms a composition of very great refractory power.

Plumbago crucibles of ordinary manufacture, calculated to run about twenty heats, would, when coated with the composition, run about thirty heats, thus increasing their heat-bearing power fifty per cent. The materials used in the composition are inexpensive, and the time and labor consumed in applying inconsiderable. At a cost of ten per cent. for coating a crucible fifty per cent. in value is added, thus saving the manufacturer forty per cent. When the extensive use of plumbago crucibles is considered, and the necessity, from

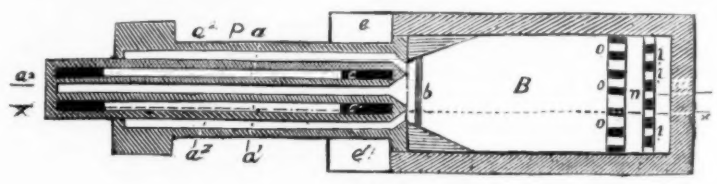


Fig. 2.

their perishability in the uses to which they are subjected, of very frequently renewing them, it will be seen that, by this invention, a great saving will be effected by the manufacturers. Another very considerable advantage is, that my composition is less liable to retain slag or clinkers than the ordinary material from which plumbago crucibles are made.

Claim.—A compound consisting of asbestos, plumbago and kaolin.

A Venerable War Ship.

The frigate Constitution, or "Old Ironsides," as she has been familiarly called, after having lain on the stocks at the Philadelphia Navy Yard for several years a dismantled and apparently rotten hulk, has, at last, by special order from the Navy Department, been placed in the hands of the carpenters, and is now undergoing repairs, with a view, it is said, of being exhibited during the Centennial year. There is nothing remaining of the vessel except the bare hull, and workmen are now engaged in erecting the necessary staging in order to begin the work of replanking her ribs. After she has been got in a condition for the water she will be launched, and the rest of the fitting up will be done after she is in the water. It is the intention of the government to have the original appearance of the vessel, both inside and outside, reproduced as neatly as possible. The hull is already coppered, and it is thought that the remaining repairs can be completed in a comparatively short time.

Considerable interest will doubtless be felt by the public in the question as to whether any of the original timbers laid in the vessel when she was constructed in 1797 remain. There is a tradition among naval constructors that there are some of the original timbers now in the vessel, but there have been so many repairs to her, and she has been so frequently overhauled that it is almost impossible to ascertain definitely whether such is the fact or not.

The vessel is said to have suffered greatly at the hands of relic hunters, for it is asserted while she was undergoing repairs at various wharves it was no uncommon thing for a carpenter who had discovered a piece of old and "historic-looking" timber, to appropriate it and have it turned into a cane or some other article to be preserved by himself or friends as a relic. These depredations, together with the necessary removal of a large amount of decayed or insecure timber, has almost transformed the vessel into a new ship.

It was proposed by the naval authorities when it was found on the adjournment of the last Congress that no special appropriation for her repair had been made, to break her up, as it did not appear that she would be of any further use to the navy. A similar proposition was made once before, and was the cause of the well known poem, written in protest of the act by Oliver Wendell Holmes, beginning with the line

"Ay, tear her tattered ensign down."

The Constitution was built at a cost of over $300,000 at Hart's ship yard, in Boston, and was launched on the 21st of October, 1797, in the presence of a vast concourse of people. Special care was taken in her construction to use the best live oak timber, and the bending of the planking was done without steam in order that it might be the harder and more durable.

Her first commander was Captain James Nicholson, and she started upon her first cruise in July, 1798. In 1804 she was the flagship of Commodore Preble during the bombardment of Tripoli, and in the action of the 29th of August before Tripoli. She was run to within a short distance of the fortifications, and after a fierce contest silenced the guns.

On the 19th of August, 1812, the celebrated combat between the Constitution, carrying 44 guns, and commanded by Captain Isaac Hull, and the British frigate Guerriere, carrying 38 guns, and commanded by Captain Dacres, took place off the American coast, in the present track of the vessels from New York to Liverpool. After considerable manœuvering, the vessels came together late in the afternoon, and the rigging of the two vessels having become entangled both crews prepared to board. While Lieut. Morris, of the Constitution, was making an effort to lash the vessels together, the Constitution shot ahead of her antagonist, and it was then found that the Guerriere was badly shattered. Soon after, the foremast and mainmast of the Guerriere were carried overboard, and the vessel was left helpless. A few moments after, her commander surrendered.

The next action in which the Constitution was engaged was an engagement with the British frigate Java, of 38 guns, commanded by Captain Lambert. This action took place on the 29th of December, 1812, off the coast of Brazil, and lasted for three hours. A large number of the guns of the Java were disabled, her masts were shot away and her hull was badly damaged. The Constitution, on the other hand, was scarcely damaged at all. Of the crew of the Java, numbering 400, 22 were killed and 102 wounded. Her commander was among those mortally wounded. The loss on the Constitution was only 9 killed and 25 wounded.

On the 20th of February, 1814, while on her way from Bermuda to Madeira, the Constitution, commanded by Captain Charles Stewart, fell in with the British vessels Cyane, 36 guns, and Levant, 20 guns. After an engagemen lasting not quite two hours the Cyane surrendered, and two hours later the Levant, which had endeavored to escape, having been overtaken, was also compelled to surrender.

Of late years the Constitution has been used as a school ship at the Naval Academy, at Annapolis, and for a long time, while lying at the foot of the "long wharf," she has been a familiar object at the Academy. The figure-head of the Constitution has been for a number of years a wooden statue of General Jackson, which it is proposed to place in the grounds of the Naval Academy at Annapolis.

Use of Rail Ends in Blast Furnaces.—Heyrowsky says that there are different methods for using rail ends in the Bessemer process, and that it is acknowledged that 20 to 25 per cent. can be introduced into the Bessemer retort without any objection. Another use, which is in our opinion new, has lately been tried with success at the Zeltweg blast furnace, and as Zeltweg possesses a large balance of rail ends this work is very important. The production of the furnace heretofore has been 4600 cwt. of gray Bessemer pig per week; now it is 5400 cwt. This difference of 800 cwt. corresponds exactly to the quantity of rail ends used. In like manner, instead of rail ends, gray and even white cast iron could be used without diminishing the economical results.

Oil colors cannot generally be applied over cement, as they will not adhere. M. Garcin adopts the following method of preparing the surface of the cement to receive the color: 1. Priming with boiling linseed oil. 2. A coating of white lead mixed with oil. 3. A ground coat composed of white lead, Spanish white, oxide of iron and red lead ground together in oil.

Dr. Redner calculates that for every cubic meter of gas recorded as having passed through a wet gas meter twenty-three litres of aqueous vapor, or 2·3 per cent., by volume of the gas so recorded is aqueous vapor taken up by the passage of the gas through the water.

One of the latest discoveries in Pompeii is a small woolen manufactory, situated very near the house where the fresco representing Orpheus was recently discovered. Several charred fragments of tapestry were found in this place, beside various machines for carding and weaving wool.

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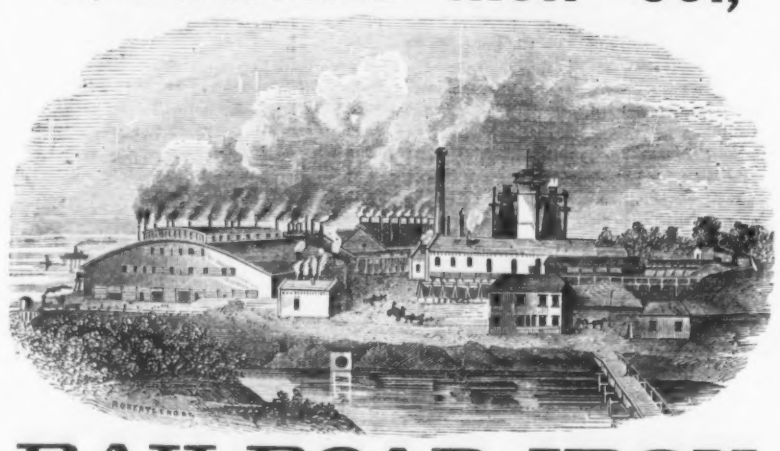
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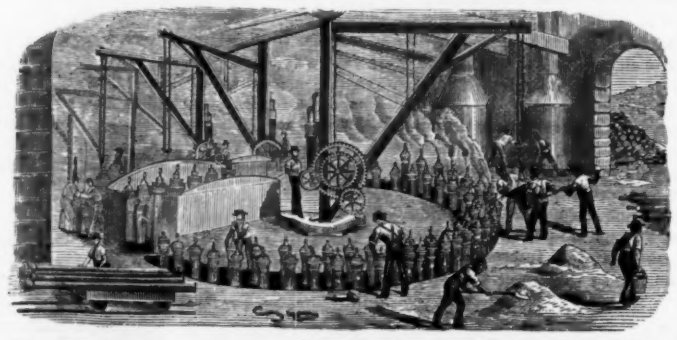
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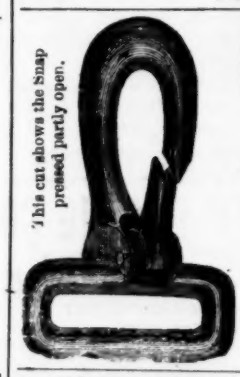
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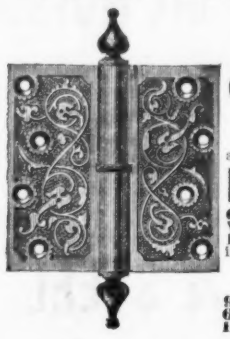
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The Limit of Carburation of Iron.

BY M. BOUSSINGAULT.

Carbon is found in very various proportions in carbonized iron; generally about one to two thousandths in bar iron, four to seven thousandths in soft steels, and ten to fifteen thousandths in hard steels. In cast iron the proportion is usually two to four hundredths, very rarely five hundredths. This maximum limit would be a presumption for believing in a definite compound, if the results of analysis had not, for the most part, to be rejected, because, the pigs often containing manganese in considerable quantity, always silicium, phosphorus, sulphur, sometimes even chromium, it then becomes impossible to deduce exactly the proportion that exists between the iron and the carbon.

In the question whether carbon and iron form a fixed combination, one can only accept, as elements of the discussion, observations made on compounds containing only carbon and iron pure, or nearly so.

Able metallurgists have carbonized iron, either by reducing the sesquioxide or melting the reduced metal in soot, or charcoal, or graphite. The experiments have mostly been made in M. Percy's laboratory (a guarantee of their exactness). The average from six observations is, iron 95·60, carbon 4·40.

Karsten endeavored to show that iron carbonized to its maximum contained 0·051 of carbon. His observations were upon a very foliated specular iron from the Mussen forges. To lessen the attendant difficulties he transformed the white pig into gray pig, in order to have only to determine the graphite.

	1	2	3
Iron, by difference	94·95	94·90	94·78
Total carbon	5·05	5·10	5·22
	100·00	100·00	100·00

M. Percy has remarked, with reason, that in specular iron of similar aspect with that of Mussen, one usually finds 4 per cent. of manganese, and it is nowhere said that the pig was free from this metal. He would not have mentioned Karsten's results if that eminent metallurgist had not concluded that specular iron, at the maximum of carbonization, is a definite compound, which may be represented by Fe_3C. (iron 94·92, carbon 5·08). He also concluded from analysis that gray pig contained less carbon than white: 0·04, on an average.

I have not found such a well marked difference between the carbon of white pig and that of gray obtained with the hot blast. It is seen (in a table given) that the proportion of carbon comes very near that of iron carbonized in a fire clay crucible lined with charcoal; is it to be said, then, that it might not, under certain conditions, be exceeded? Undoubtedly no; thus, as much as 0·06 of carbon as been met with. Accepting this figure, one can understand how iron in fusion, saturated with carbon, lets some of it escape in the state of graphite, in consequence of variations of temperature. In reality, this graphite, though adherent, will no longer belong to the mass whence it has issued, and if the metal remain in contact with the crucible, the saturation will be maintained, for it will take back the carbon it may have allowed to escape; we should then have iron carbonized to the maximum, and, grafted upon it, crystals of graphite.

In an experiment I made with the gray pig of Rio, there was produced what one might call an apparent supersaturation of the iron by the carbon. A plate of cast iron was placed in a cementing trough of the furnace, where it remained a month. From analysis it appeared that before cementation the total carbon was 4·05 per cent.; after cementation, 5·07 per cent.; showing a gain of 1·02 per cent. The iron assumed, through cementation, an almost black hue; its fracture presented numerous facettes, among which one could distinguish crystals and lamellæ of graphite, of much brilliancy.

Before making known the experiments made in the steel works of Jacob Holtzer to determine the maximum of carburation, I will summarily recall the general properties of cast iron, in order to see if we shall meet with them in a metal strongly carbonized, and differing from the products of high blast furnaces, in that it contains only iron and carbon.

The specular irons come from manganesiferous ores; the size and silvery brightness of their facettes depend especially on their proportion of manganese, varying commonly from 2 to 7 per cent.; they are hard, and so brittle that they may be pulverized. The ores even when they contain little manganese, furnish according to the working of the high blast furnace, and particularly with the co'd cast, granular white pig iron.

The white pig irons contain carbon in the combined state, at least for the most part. The gray pig irons owe their aspect to disseminated graphite; they are produced in the furnace with hot working; the carbon in them is in two states, combined and free. When dissolved in an acid they give a graphitous residue.

White pig iron is more fusible than gray; it acquires a pasty consistence before being liquefied, whereas gray pig iron enters into fusion instantaneously; it is either solid or liquid. Fused and cooled again rapidly, it perserves all, or nearly all, its carbon in the combined state. Cooled slowly, it is said to change into gray pig iron, a part of the carbon separating in the state of graphite.

Gray pig iron, liquefied and cooled, promptly passes into the state of white pig iron, the graphite combining with the metal. Thus it happens, that when it is allowed to flow upon a good conducting body into an ingot mold, the part suddenly solidified, on contact with the cold metal, becomes white pig iron; while above the zone touching the mold, the metal retains its character of gray pig. This modification is shown even when large masses are operated with. An anvil block, weighing 56,000 kilogs., cast by M. J. Holtzer, in the works at Unieux, had its surface converted into white pig.

The transformation of a white pig iron (in which the carbon is invisible, because it is combined) into gray pig (in which one perceives the carbon, because it is free), must, I think, be attributed to the iron uniting with the carbon at a high temperature, either by combining with it or by dissolving it.

The combination is the more probable, since, on the one hand, it is established that, at a high degree of heat, iron in prolonged contact with wood charcoal kept in excess, fixes only a limited quantity of carbon; and, on the other, that, in uniting with a body absolutely refractory, it forms a compound fusible at a degree much below that of its fusion when it is pure. It is true that, by a gradual lowering of the temperature, iron carbonized to a maximum (cast iron), and fused, gives up carbon, which appears in the state of graphite in the cooled mass. There is here, it may be observed, an analogy with what takes place when a salt is separated from a hot solution, saturated in the process of cooling, or, better still, in the precipitation of graphitoid silicium from zinc, with which it was united during the fusion.

Whatever opinion may be arrived at as to the state of carbon in fused carbonized iron, combination in definite proportion or saturated solution, the compound or solution is always, by the fact of appearance of graphite during the cooling, impoverished of all the carbon become free.

Everything tends to prove then, that in carbonized iron in fusion the whole of the carbon is combined with the metal, and that it is during the lowering of temperature that a part of this carbon is set at liberty. It must not be inferred that iron carbonized to a maximum exists only in the liquid state; since it suffices that solidification be rapid, in order to there being no separation of graphite. The solid metallic mass is then homogeneous, and similar in color, hardness, fragility, to white pig iron; all the carbon is combined with iron, as it was during fusion. It is not so when, by slow cooling, graphite appears; the metallic mass, become solid, is not homogeneous. There is in it carbon in combination, free carbon, and very probably pure iron (not allowing the existence of polycarburets, according to Karsten, which is very doubtful).

It was to corroborate the ideas just given that an experiment was made at Unieux, in the Holtzer works, as to the combination of iron with carbon, in which, very happily, a Swedish iron was at disposal that was free of manganese and nearly pure, since it contained 0·9961 of metal.

(1) In a charcoal-lined crucible, No. 2, there was put 10 kilogrammes of iron in fragments, care being taken to fill the intervals with wood charcoal. (2) In a crucible, No. 1, 10 kilogrammes of iron were similarly arranged. The crucibles were placed in a Siemens' furnace. A clean plate of cast iron bordered with a hoop of an ingot mold was arranged to receive the fused metal.

The tapping of crucible No. 2 took place after three hours and fifty minutes; the matter was very liquid. Solidified, it had a thickness of 10 to 14 millimeters, divided into two zones nearly equal, without distinct separation; the lower zone, hardened by contact with the plate, was white. The upper zone presented a dark gray tint, and a fine grain. At some points, where they interpenetrated, the two zones had a red-spotted appearance.

The tapping of crucible No. 1 took place after nine hours ten minutes in the furnace. The cast, with a thickness of 13 to 15 millimeters, was separated into two parts perfectly limited. The lower hardened zone was white; it was about a third of the thickness of the upper zone, which was granular and dark gray.

In the carbonized iron, No. 1, were found:

	Iron.	Combin'd carbon.	Graph.	Total carbon.
In the mass	95·90	2·10	2·00	4·10
In the white zone	95·99	3·585	0·425	4·01
In the gray zone	95·22	2·67	2·11	4·78

Thus none of the bars carbonized to a maximum were free of graphite. It is in the hardened white zone of No. 1 that least of it was found, four one-thousandths. Neglecting this small quantity, this white zone would have nearly the theoretical composition Fe_3C; one equivalent of carbon combined with five equivalents of iron; and the carbonized iron, No. 1, cast at a temperature the most intense, has exactly the composition, Fe_3C—(iron, 95·90; carbon, 4·10).

Only a half, however, of the carbon is combined, the other half is free; it is graphite. The whole of the carbon was no doubt united to the whole of the iron in the carburet in fusion; the dissociation of a part of the compound, Fe_3C, would commence during the lowering of temperature. If, then, the hardened white zone in No. 1 has preserved the composition, Fe_3C, which it had in the liquid state, it is because the cooling has been sudden, and so the molecules of graphite have not had time to unite, in virtue of the affinity which draws them together when the metallic mass approaches viscous consistency.

The dissociation having for index the appearance of graphite, must take place in all the carbonized irons in which this carbon is found, and as there cannot be in the cooled metal the equivalent of free carcon, without there being at the same time five equivalents of free iron, it may, after solidification, be considered a mixture of carbonized iron, Fe_3C, of graphite and iron. Indeed, it would hardly be natural to suppose that the mass in which the graphite, is disseminated is formed of one of several polycarburets; and as little likely that the iron and the carbon combine in all proportions, a thing which would be without precedent in chemistry, and the more singular as it has been established by experiments I have published, that whatever the intensity of the temperature, iron takes only a limited quantity of carbon. Thus, this metal which sometimes unites with one ten-thousandth and less of the combustible, could not take more than four one-hundredths to five one-hundredths. For the rest, whatever, the probability of existence of a compound Fe_3C, one could not accept it definitely, except it were successfully isolated. Nothing is more curious than these changes in the nature of iron carbonized to its maximum, produced by effects of temperature; gray pig iron transformed into white pig by the union of free carbon and free iron; and reciprocally white pig metamorphosed into gray pig by the setting at liberty of carbon and of iron.

The occasions for observing the transformation of white pig into gray pig are not frequent in forges, and I thought it useful to make the experiment of this transformation in Jacob Holtzer's works; operating with a large quantity of metal, so that the cooling of the fused mass might be rendered as slow as possible.

At 4 p. m., two crucibles, containing each 15 kilogs. of specular iron of Rio, were placed in a Siemens' furnace, in which steel was cast. At 7 the crucibles were closed, and the cooling was sufficiently slow for these to be still of a dark cherry red 36 hours after closure; the cooling lasted fifty hours. The crucibles were broken, and in each of them was found a pretty homogeneous mass, over which was a layer of yellowish green dross, 35 mm. in thickness. The two masses, broken under the stamper, presented all the appearances of a gray granular pig, pretty malleable, and of great tenacity.

The following were the results of analysis:

	White pig.		Gray pig.	
Combined carbon	3·800	3·800	0·660	3·442
Graphite	0·000		2·782	
Silicium	0·000		0·660	
Sulphur	0·100		0·020	
Phosphorus	0·075		0·080	
Manganese	2·585		1·750	
Iron	92·935		93·945	
	99·915		99·897	

Comparing the results, one sees that the quantity of phosphorus is the same in the two casts. The gray contains one-fifth of the sulphur of the white. There is less carbon and more silicum in the gray pig. A remarkable thing is that during the transformation of white pig iron into gray, more than a third of the manganese disappears. This seems so singular that it should be verified by several determinations. It is probable that the manganese wanting has passed into the green dross formed on the surface of the casting during fusion. The analysis of the cast, before and after its transformation into gray pig, showed:

	Carbon.	Silicium.
White pig	3·800	0·420
Gray pig	3·442	0·660
	−0·358	+0·240

In the gray pig four one-thousandths of carbon must have been replaced by two and one-half thousandths of silicium coming certainly from the crucible or the dross disseminated in the casts of the first tapping; silicon, indeed, at a high temperature in presence of iron, becomes a burner of carbon.

These researches on carburation are additional evidence that in cementation, the carbon has chiefly for origin the fixed carbon of the wood charcoal; further, the possibility of union of the two solid bodies, iron and carbon, in contact at a high temperature, is no longer in question, since the memorable experiment of Clouet, in which the iron is changed into steel by combining with diamond; a decisive experiment, in my opinion, though, in reality, Clouet obtained cast steel, because the fusion of carbonized iron is always preceeded by a penetration of carbon into the solid metal. It is thus that platinum, and, as I have found quite recently, iridium and palladium, kept red hot in a charcoal dust capable of furnishing silicium, are first cemented by this metalloid, before giving, on intervention of heat sufficiently intense, the regular casts of silicurets.

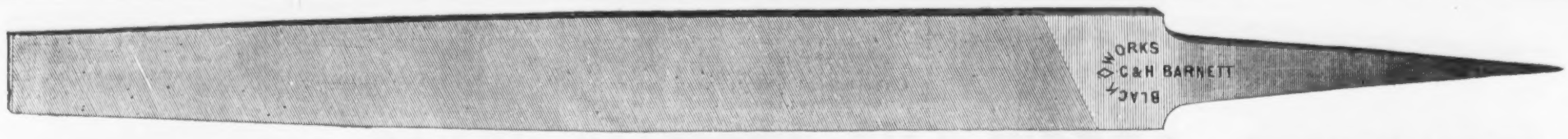
This is precisely what occurs when iron is heated in diamond powder, in graphite, in sugar charcoal, or in strongly calcined soot; here, too, the carburation precedes the fusion, and under these conditions, it takes place without the concurrence of combustible gases.

Refractory Clay for Lining Puddling Furnaces.

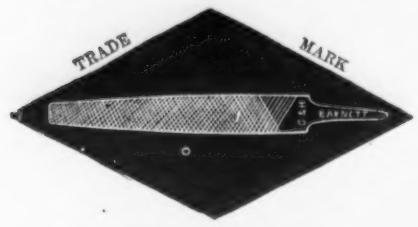
The Wheeling (W. Va.) *Standard* says:

A new material for protecting the throats of puddling furnaces has been tried at Furnace No. 11, Belmont forge, and found to be wholly practicable, and not only much cheaper than the ordinary fire clay, but better suited to the purposes of the puddling furnace. Joseph Diebold, one of the boilers at No. 11, states that the new clay proves perfectly satisfactory to him in every way, and he has been using it for two or more weeks.

It consists of a sort of clay found in the coal seams in this section, and is commonly known as soapstone. About a year since, it was discovered to be a very good fire clay by Messrs. Dwight and Leighton, who experimented with a view of adapting it to making glass pots for use in the glass works of Hobbs, Brockunier & Co. It was decided by these gentlemen to be unsuitable for that purpose; but Mr. Dwight subsequently, about three weeks since, called the attention of Messrs. Altmeyer and Burke, of the Belmont Works, to the clay as a protector of their forges. This led to an examination and the experiment noted. The clay requires to be thoroughly air slacked, ground and mixed with brick dust before use. It lies in the six feet vein worked by the Belmont Company in varying thickness, ranging from 6 to 30 inches, and is a great encumbrance to the coal miners. The general adoption of this article by the forges of this section would cause quite a revolution in the operation of puddling, and if it continues to prove as successful as it has been already, there is said by some of our boilers with whom our reporter has conversed, to be but little doubt that finally it will come into common use.



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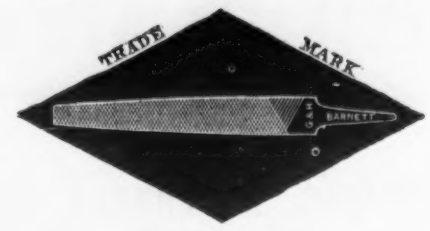
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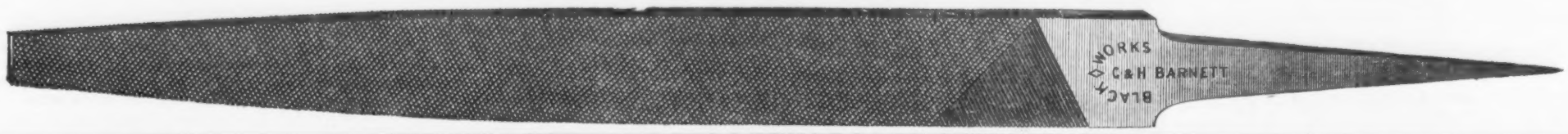
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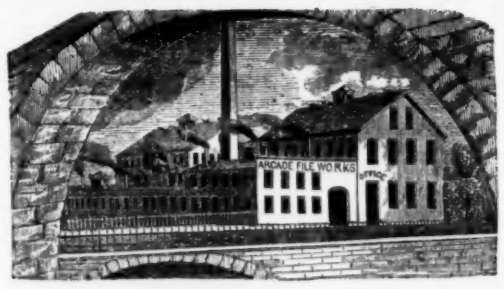
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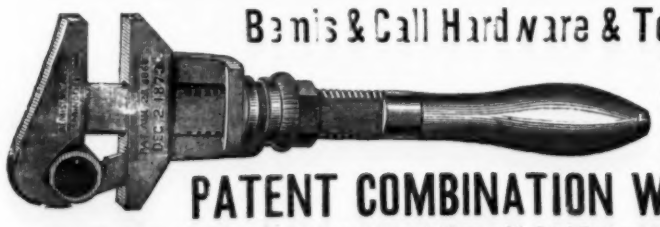
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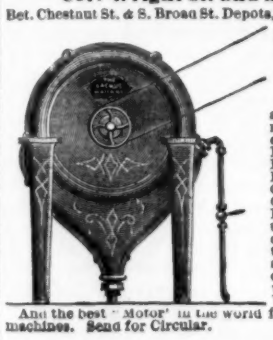
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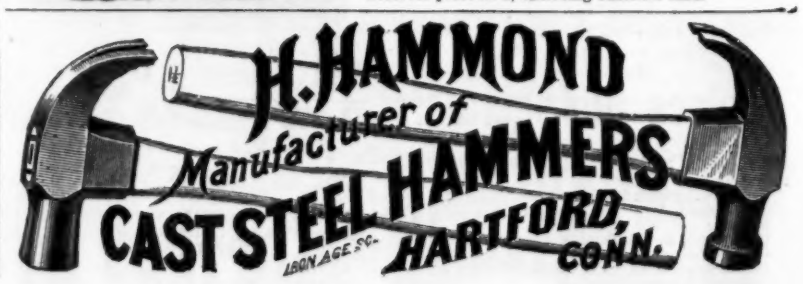
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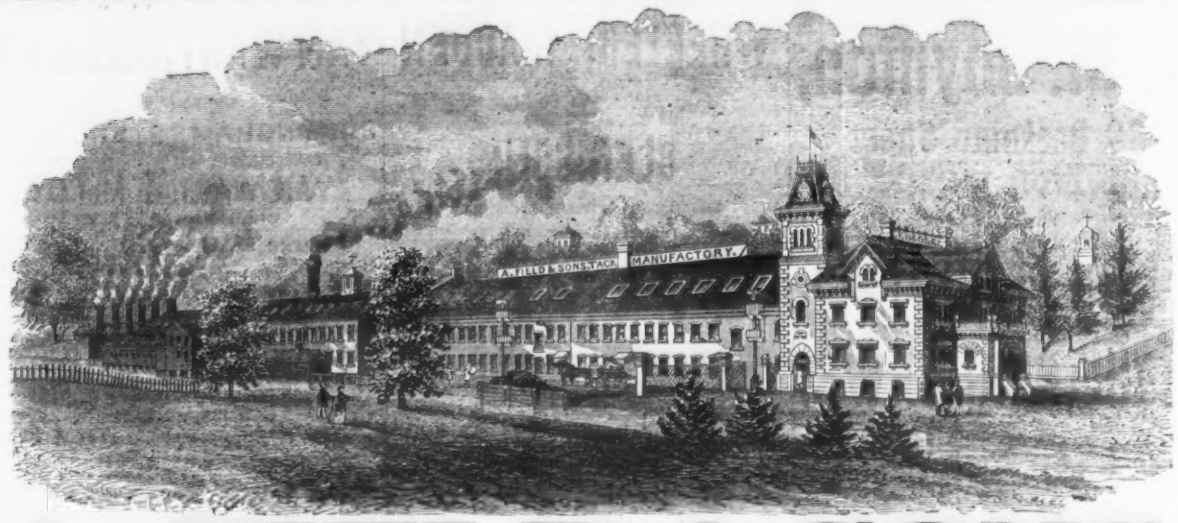
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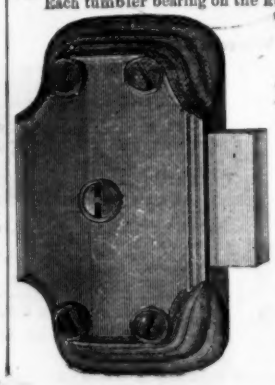
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Which are stronger than steel, *and cannot be affected by rust*, and will remain bright and clear under all ordinary circumstances.

A candid examination will convince the most unbelieving, that for simplicity, durability, convenience, and safety, they challenge comparison with any now before the public. Being made entirely by new and expensive machinery, especially constructed to manufacture them, *they will rival the best made Locks in Finish and perfect operation.*

These Locks give perfect satisfaction, because they are the safest, cheapest and most durable Lock ever presented to the public, having *thirty-five* finely finished Brass Tumblers in each Door, and twenty-eight in each Drawer Lock, each one being finely false notched.

Each tumbler bearing on the key at two different points while locking or unlocking, without the aid of springs, which cannot be said of any other patent Tumbler Locks in use.



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CRANE BROS MFG. CO.,

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BUSINESS ITEMS.

PENNSYLVANIA.

The Marietta Furnace No. 1, Marietta, Pa., Ethelbert Watts, proprietor, has been blown in, and had a most satisfactory "go off." The match was applied at 2.30 p. m., July 20th, and the blast (1½ lbs., 800°) was put on at 10 p. m. the same day. The first cast was made on the 21st, and the manager hopes to continue making about 500 tons foundry iron per month.

The Harrisburg Car Manufacturing Company will soon commence on a new contract for the construction of one hundred cars for the New York Central Railroad. The old contract (three hundred cars) will be completed in about ten days.

Geo. W. Snyder's works, at Pottsville, are working night and day on two five hundred horse-power engines, for the Mammoth Vein Coal Company.

The tack factory at Wheeling started up on Monday, after being idle for a month.

It is reported that the furnace of the Topton Iron Company will soon be blown out.

Hussey, Binns & Co., Pittsburgh, are erecting a 24 pot Siemens furnace at their shovel works. This will add greatly to their facilities for making shovels.

Columbia proposes a manufactory of agricultural implements.

Shoenberger & Co , and Zug & Co., consume nearly the whole product of the nail keg department of the Pittsburgh Saw Mills, which produces about 1000 kegs per day on an average.

In our issue of the 15th instant we stated that the Tanite Emery Wheel Co., at Weissport, had shut down their works for a time for the purpose of enlarging their manufacturing facilities. We should have said the Lehigh Valley Emery Wheel Co., located at Weissport. The alterations referred to are now completed, and the company are running their factory on orders for the well known "Lehigh wheel."

MASSACHUSETTS.

Work at the Springfield armory has been resumed.

The works of the Kinsley Iron Company, Canton, are running again.

F. A. Brown & Co., of Pittsfield, have just turned out, at their new iron foundry, the largest casting ever made in that town. It is a plate of iron 12 feet long by 3½ feet wide and 5 inches thick, and weighs over 6500 pounds. It is for the Berkshire Glass Works, to be used in making plate glass, and is corrugated on the under side, to prevent it from splitting with the heat when the melted glass is poured upon it. It is made of charcoal iron. After leaving the foundry the surface is to be planed off at the works of William Clark & Co., on Depot street.

The Gosnold Mills, New Bedford, which have recently been stopped for repairs, will start up on Monday next. Orders sufficient to run the mills five or six months to come have recently been secured. The business of chain making has been added to that of iron rolling.

The Arms & Bardwell Manufacturing Company, Northampton, are making samples of Kellogg's patent skate, and expect soon to commence making them.

The Kitson Machine Co., Lowell, employ 175 men filling orders for their patent cotton openers and lappers. They are to furnish 13 machines for the new Wamsutta Mill, New Bedford; 8 machines for the Lockwood Company, Waterville, Me.; not to mention large orders from the Piedmont Manufacturing Co., South Carolina; the Trion Manufacturing Co., Georgia, F. H. Stafford & Co's Barrowsville Mill; the Annisquam Mills, Rockport; the Hookset Manufacturing Co.; the Vermont Mills, Bennington; the Blackstone Manufacturing Co., and others.

The Valley Machine Works, at Easthampton, are building a No. 9 steam pump, with a capacity of about 500 gallons per minute, for the American Institute Fair, at New York, next fall.

A Thompson 12 inch, steel-lined, rifled, breech-loading cannon has just been completed by the South Boston Iron Works. It weighs 82,280 pounds, or over a ton more than the famous Krupp gun exhibited at the Vienna Exhibition. The destination of the gun is supposed to be Sandy Hook, where a United States government commission are now engaged in testing and experimenting with heavy ordnance.

CONNECTICUT.

The Russell & Erwin Manufacturing Co., of New Britain, have given out the necessary contracts for buildings and machinery for the manufacture of screws. The buildings will be erected on land owned by the company, and adjoining their extensive hardware and lock factory. This important addition to the manufacturing industry of New Britain will, it is expected, be in full running order with capacity for the production of a complete assortment of screws by February 1st, 1876.

INDIANA.

The Indianapolis Rolling Mill Company are running double turn, and rerolled nearly 2000 tons of rails during the month of June.

The Union Lock Works, Indianapolis, have recently made shipments to furniture manufacturers in New York, Philadelphia, Buffalo and Cincinnati.

MISSOURI.

The Joplin Boiler and Machine Shop has received new machinery, and will soon be ready to do anything in the repairing of machinery, such as boring out steam cylinders, pumps and all kinds of lathe work; also, boiler and sheet iron work, and pump pipe of improved make.

The St. Louis Smelting and Refining Company has just closed the shipment of 70 tons of copper *matte* to an Eastern concern. It is not probable that such shipments will be often repeated. The company have it in contemplation to include copper smelting and refining in their purpose, and add to the present establishment the additional plant requisite. The recently constructed Flintshire furnace is working splendidly. In the few weeks of its run over 7000 pigs of lead have been produced from the by-products which this type of furnace was intended to treat.

Novelty in Refrigerators.

Mr. Alex. M. Lesley, of this city, has conceived the idea of a refrigerator which should combine at once the utility of a refrigerator and the elegance of a sideboard, suitable for even the most tasteful dining room, whereas the ordinary refrigerator is out of place except in the kitchen or cellar. The carrying out of this idea has resulted in a refrigerator having the exterior form of a sideboard, and possessing all the cooling qualities of the kitchen or zero refrigerator manufactured by him, and at a cost only double the latter.

It is constructed of solid wood, usually of black walnut and oak, the whole tasteful in appearance, being susceptible of any desired amount of ornamentation.

In addition to its appearance it has many advantages over the common refrigerator, such as freedom from the heat of the kitchen, and the unpleasant odors which attend cooking; beside, in a measure, cooling the atmosphere, which would be imperceptible in a heated kitchen.

The ice chamber being entirely separate from the contents of the refrigerator, the ice cannot possibly be affected by the various odors arising therefrom, while the waste ice furnishes from a faucet a constant supply of ice water for drinking purposes.

The milk and wine cooler, also a separate compartment, forms a very desirable feature of this refrigerator, and, together with the excellent arrangement of the principal portion under it, is complete and entirely satisfactory in its results

Connecticut Mica.

We have received from Mr. F. A. Hull, of the Hull & Belden Company, some remarkably fine specimens of mica taken from a newly opened mine near Danbury, Connecticut. The mica is of extraordinary quality, and if not as white as some we have seen, is remarkably free from checks and flaws. The vein is said to be of great extent, and blocks of unusual size are being taken out. The Danbury *News* gives the following characteristic description of the mine:

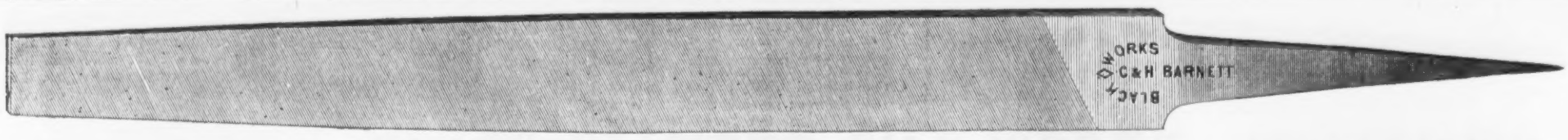
"The deposit or lead of mica was discovered about two months ago by the owner of the farm, Mr. Bates, while digging a cellar for a new house which he proposed erecting. The value of it was not then shown, as the specimens he extracted were very small and cloudy, and easily broken. But the indications of a 'rich find' were so good, he determined to call the attention of experts to the matter. In Danbury he found several, who visited the spot, made excavations, traced up the lead, and finally entered into negotiations for a lease of the farm to work the vein. Mr. Fred. A. Hull, of the Hull & Belden Company, became the lessee. He immediately began the work of getting out the mineral. He erected a huge derrick, capable of lifting the heaviest rock, dug a pit and struck a yet richer vein than the one first discovered. The last vein runs directly east and west, and although it has been followed up for a distance of nearly thirty feet, the end has not yet been found. An excavation of nearly thirty feet has been dug, and the mica grows better and better the deeper it goes.

"The value of it cannot yet be estimated, but that it is a perfect 'bonanza' cannot be doubted. When it is considered that this is one of the scarcest of all minerals, and that enough cannot be found to supply the stove trade of the country, some idea of its value can be obtained. Pieces five inches by seven are sold at from $3 to $6 per pound, and large pieces, a foot square, are worth a good deal more. So far as they have gone, the pieces average about eight inches square. We were shown one large piece, weighing, perhaps, twenty-five pounds, which was ten by eighteen inches, and which is worth about $10 per pound."

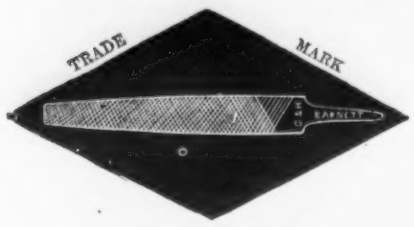
Thus far Mr. Hull has only taken out the mica in the rough, but will manufacture a large stock in anticipation of the demands of the stove trade next season. We understand that Mr. Hull desires to sell his lease, in whole or in part, on reasonable terms.

The Scofield Rolling Mill.—The Atlanta (Ga.) *Herald* says: Yesterday, while on our reportorial rounds, we stopped at the rolling mill to make inquiry about the resumption of work on Monday. We found the men well pleased with the prospect of work for next week. On going into the mill we heard Mr. Goodnow giving orders that allayed all doubts we had about the mill being put into active operation Monday. He told the foreman of the rolling department to have one furnace lit up to-day, to test all the steam pipes, and to put the blacksmith to work at once. He then notified all of the heaters to have their furnaces in readiness for work Monday. On being asked if he was going to have his iron puddled in Chattanooga, and keep the puddling furnaces closed as Mr. Scofield did the last month that he run the mill, he replied that he intended to run the whole mill day and night, and have all of his iron puddled in the mill. He intends giving all the men their old positions in the mill, and has even gone so far as to notify by mail those men who have left the city that work will be resumed in the mill Monday.

The Sharon *Times* says that the Westerman Iron Company have bought several hundred tons of muck bar from Middlesex and old rails from Youngstown, which indicates that those works are going to continue operations, and with increased energy.



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PRICE LIST.

BLACK DIAMOND FILE WORKS.

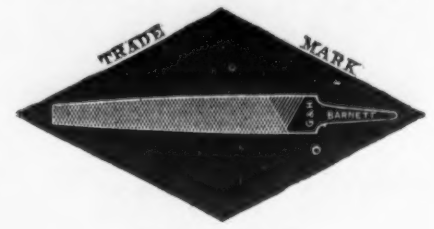
G. & H. BARNETT,

39, 41 & 43 Richmond Street, PHILADELPHIA.

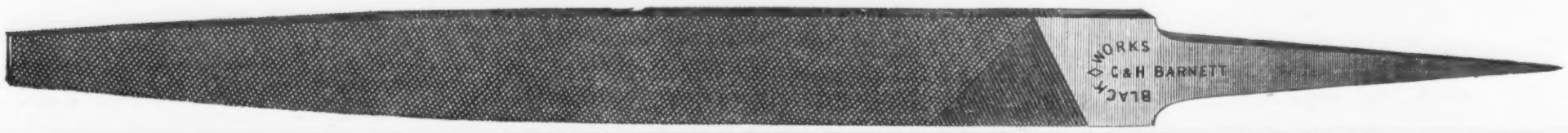
SOLE AGENTS:

LINFORTH, KELLOGG & CO., 3 & 5 Front St., San Francisco, for the Pacific Coast.
SEMPLE, BIRGE & CO., 13 South Main St., St. Louis, Mo.

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PRICE LIST.



USE THE BEST.



Pawtucket, R. I.

The American File Company have the exclusive right to use the Bernot process for cutting files By this method all the advantages of hand cutting are secured, together with an accuracy unattainable in hand work. They are the only manufacturers who employ machinery for testing files and steel.

Goods of all known manufacturers have been repeatedly tested, and interesting tables have been compiled showing the working qualities of files made by different makers, and of files made from different steels, and with various shapes and angles of tooth They have thus reduced the manufacture of files to an exactness and perfection with a uniformity of result, as they believe, never before attained. No file, foreign or domestic, that they have ever tested, has equalled the performances of their own goods taken at random from their stock. Their machines are capable of the most delicate adjustment, and can produce the very finest work known to the trade. Special files made to order. Prominent file manufacturers are having their best goods from our works.

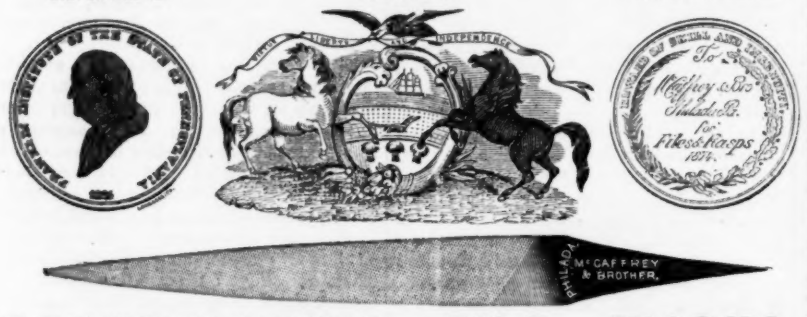
Price lists and information furnished on application.

AMERICAN FILE CO., Pawtucket, R. I.

THE BEST IS THE CHEAPEST.

McCaffrey's Standard American Hand Cut Files and Rasps are warranted to do more work than any other files and rasps in the market.

SILVER MEDAL. TRADE MARK. HIGHEST PREMIUM.



PENNSYLVANIA FILE WORKS.

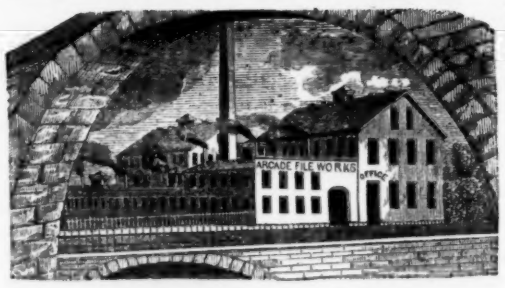
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No. 1732, 1734 & 1736 North Fourth St., Phila.

Messrs. ARNOLD & CO., 310 California St., San Francisco. Sole Agents for the Pacific Coast.

ESTABLISHED 1848.

C. T. DRAPER & CO.
Sing Sing, N. Y.
Manufacturers of SUPERIOR HAND CUT



FILES and RASPS
Made from Best ENGLISH CAST STEEL.
Quality guaranteed by written warranty when required.

JOHN I. BROWER & SON,

Hardware Merchants,

288 Greenwich Street, NEW YORK.

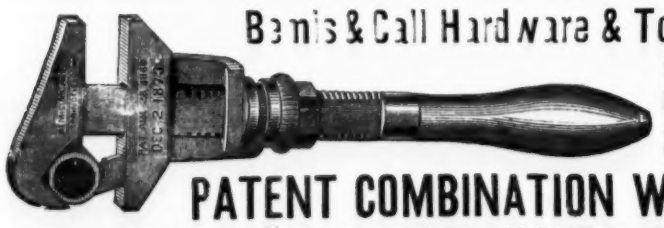
HORSE SHOES.
Burden's,
Perkins',
Salisbury
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Goodenough
Shoemaker.

HORSE NAILS.
Putnam's,
Globe
Vulcan,
Ausable,
Ausable Pointed & Polished,
Ausable Pointed & Blued.

HORSE RASPS,
Thos. Turner & Co.'s, Sheffield Eng.

TOE CALKS,
Winsted.

HAY RAKES,
Breakenridge's.



Bemis & Call Hardware & Tool Co.'s

This Wrench can be furnished with Briggs' Pat. Nut or Sleeve.

PATENT COMBINATION WRENCH.

These Wrenches are made from the best of Wrought Iron, with Steel Head and Jaw, Case-Hardened throughout, and not only combine all of the superior qualities of our cylinder or Gas Pipe Wrenches, but use all requisite Combinations of a regular Nut Wrench, thus making a Combination which has no equal. For Circulars and Price List, address,

BEMIS & CALL HARDWARE & TOOL CO., Springfield, Mass.

L. B. HELLER. I. R. DENMAN.

L. B. HELLER & CO.,

Manufacturers of Celebrated

American Horse Rasps and Files.

OFFICE, 190 Market Street,
P. O. Box, 223. NEWARK, N. J.

W. C. DUYCKINCK,

Importer and Manufacturer of
Steam Water Gauges,
Pipe and Fittings,
Scotch Glass Tubes,
Tube Expanders,
Twist Drills,
Emery Wheels,
Pipe Fitters' Tools,
Moulders' Tools,
Blacksmiths' Tools,
Machinists Fine Tools
Forges,
Hammers,
Wheelbarrows,
Wrenches,
Jack Screws,
Vises,
Flue Brushes,
Waste,
Belting,
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Stubs' Goods,
Hair Felt,
Polishing Felt,
Emery Cloth,
Hand Drills,
Iron Punches,
Iron Shears,
Files,
Governors,
Bolts,

Railroad & Machinists' Supplies.

SEND FOR PRICE LIST.

50 and 52 JOHN STREET, NEW YORK.

ELIAS G. HELLER. GEO. E. HELLER.
PETER J. HELLER. JOHN J. HELLER.

HELLER & BROS T M NEWARK, N.J.

We invite the attention of the trade to our **Celebrated American Horse Rasps and Files.** These Rasps are made from the very best American Steel, all cut by hand, and we warrant them equal to any other make in the market. For the information of persons unacquainted with our goods, we will state that every File or Rasp manufactured by us, since our establishment in 1866, have been stamped "*Heller & Bros.*" though commonly called the "*Heller Rasp.*" All Rasps not stamped as annexed diagram are not genuine. We will send ample lot, if requested, and if not as represented they can be returned, or held subject to our order, free of all charges. For sale by the leading Hardware Dealers in the United States.

BACKUS BROTHERS,

Manufacturers of

The Backus Water Motor,

Cor. Wright St. and Ave. A,

Bet. Chestnut St. & S. Broad St. Depots, Newark, N. J.



What They will do.

These Motors are adapted to running light machinery, such as Coffee Mills, Printing Presses, Lathes, Drug Mills, Church Organs Sausage Cutters, Ice Cream Freezers, Elevators, Hoisting Machines and everything requiring similar power, in cities or towns where there are Water Works.

And the best "Motor" in the world for family sewing machines. Send for Circular.

Established 1816.

Peter A. Frasse & Co.,

95 Fulton Street, New York,

SOLE AGENTS FOR

Thomas Turner & Co.'s Suffolk Works,

SHEFFIELD.

FILES AND HORSE RASPS,

And Importers of

P. S. STUBS' FILES, TOOLS & STEEL,

W. J. Davies' Sons' London Emery Cloth,

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AUBURN FILE WORKS,

Superior Hand-Cut

FILES AND RASPS,

MADE FROM IMPORTED STEEL. EVERY FILE WARRANTED.

FULLER BROS., Sole Agents,

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JOHN ROTHERY'S

Celebrated Hand-Cut FILES,

Made of Best English Cast Steel.

WALSH, COULTER & FLAGLER, Sole Agents,

83 Chambers and 65 Reade Streets, N. Y.

Croquet or Lawn SETTEES,



With Folding Tents,

For Parks, Lawns or Croquet Grounds

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Gooch's Pat. Ice Cream Freezers,

ZERO REFRIGERATORS,

Nickeled Table Ware,

HILDRETH'S PATENT BIT BRACE,

CROQUET, Garden Trellises.

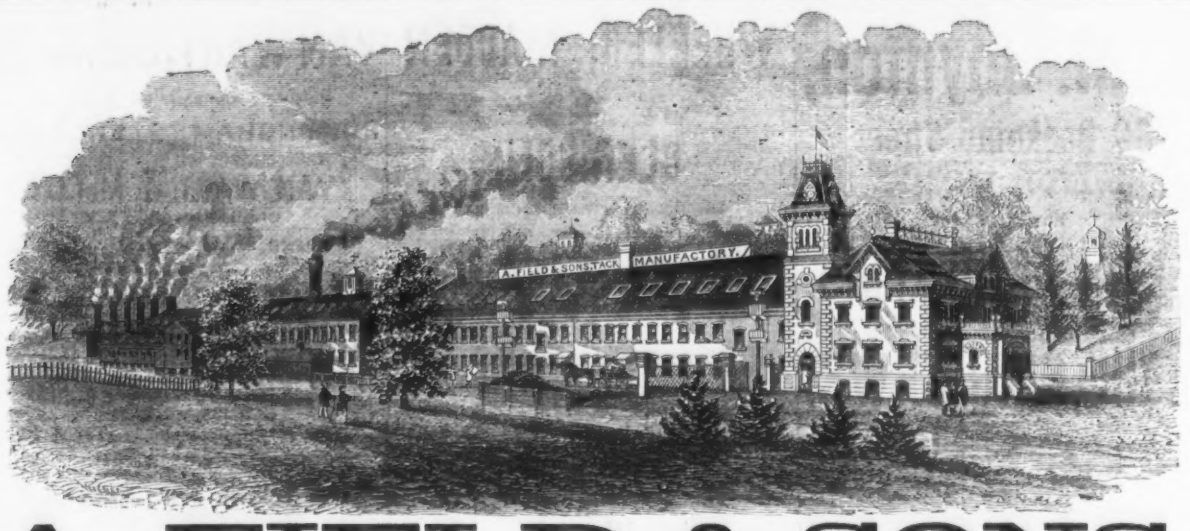
G. WEBSTER PECK,

Manufacturers' Agent,

110 Chambers Street, N. Y.

Send for price lists, enclosing business card.





A. FIELD & SONS,

TAUNTON, MASS., Manufacturers of

COPPER & IRON TACKS, TINNED TACKS,

SUPERIOR SWEDES IRON TACKS. for Upholsterers' Use, Saddlers' Supply, Card Clothing, etc., etc.

American and Swedes Iron Shoe Nails,

Zinc and Steel Shoe Nails, Carpet, Brush and Gimp Tacks, Common and Patent Brads. Finishing Nails, Annealed Trunk and Clout Nails, Hob and Hungarian Nails, Copper and Iron Boat Nails, Patent Copper Plated Tacks and Nails.

Fine Two Penny & Three Penny Nails, Channel, Cigar Box & Chair Nails, Leathered Carpet Tacks, Glaziers' Points, Etc.

OFFICES AND FACTORIES AT TAUNTON, MASS. WAREHOUSE AT 78 CHAMBERS STREET, N. Y.,

where may be found a full assortment of Tacks, Brads, &c., for the accommodation of the New York Wholesale and Jobbing Trade.

☞ Any variations from the regular size or shape of the above named goods made from samples, to order. ☜

Hopkins & Dickinson Manufacturing Co.,

FINE METAL WORKERS,

Works, Darlington, N. J. **69 Duane Street, N. Y.**

Hand Made Locks and Real Bronze Hardware.

NEW AND ARTISTIC DESIGNS FOR

Private Residences, Banks, Churches and Public Buildings.

OTIS PASSENGER —AND— FREIGHT ELEVATORS

For HOTELS, OFFICE BUILDINGS, STORES, WAREHOUSES, FACTORIES, MINES, BLAST FURNACES, &c.

OTIS BROTHERS & CO.

SOLE MANUFACTURERS,

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MANUFACTURERS OF

SPRING BALANCES,

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THE

CANADIAN BANK OF COMMERCE.

Capital - - $6,000,000, Gold.

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The New York Agency, 50 Wall St.,

Buys and sells Sterling Exchange, makes Cable Transfers, grants Commercial Credits, and transacts other Banking Business.

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CRANE BROS MFG. CO.,

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METALS.

Anthracite Pig Irons,

COLD AND WARM BLAST CHARCOAL IRONS,

American and English Bessemer Irons, Iron Ores.

COPPER, TIN, &c.

Advances made on Merchandise.

RHODE ISLAND HORSE SHOE CO.,

OFFICE, 81 Canal Street, Providence, R. I. **WORKS at Valley Falls, R. I.**

Manufacturers of

PERKINS and RHODE ISLAND PATTERNS of

HORSE AND MULE SHOES.

AMERICAN LOCK MFG. CO.,

Manufacturers of

FELTER'S

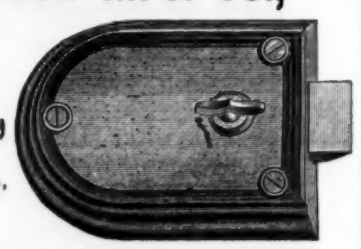
Locks & Latches,

Comprising

Store Door Locks, Night Latches, Drawer, Desk and Pad Locks,

All of which are furnished with





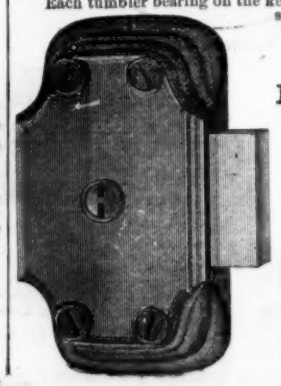
SMALL, FLAT, AMERICAN STERLING METAL KEYS,

Which are stronger than steel, ***and cannot be affected by rust,*** and will remain bright and clear under all ordinary circumstances.

A candid examination will convince the most unbelieving, that for simplicity, durability, convenience, and safety, they challenge comparison with any now before the public. Being made entirely by new and expensive machinery, especially constructed to manufacture them, ***they will rival the best made Locks in Finish and perfect operation.***

These Locks give perfect satisfaction, because they are the safest, cheapest and most durable Lock ever presented to the public, having ***thirty-five*** finely finished Brass Tumblers in each Door, and twenty-eight in each Drawer Lock, each one being finely false notched.

Each tumbler bearing on the key at two different points while locking or unlocking, without the aid of springs, which cannot be said of any other patent Tumbler Locks in use.



THE LOCKS ARE FITTED TO THE KEYS,

And not the Keys to the Locks.

Hence Counterfeit Keys cannot be made.

For descriptive list and terms, address

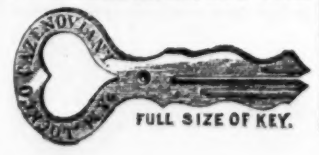
AMERICAN LOCK MFG. CO.,

OFFICE and WORKS, Cazenovia, N. Y.,

Or, **UNION NUT CO., Agents,**

78 Beekman Street, New York.





FULL SIZE OF KEY.

BUSINESS ITEMS.

PENNSYLVANIA.

The Marietta Furnace No. 1, Marietta, Pa., Ethelbert Watts, proprietor, has been blown in, and had a most satisfactory "go off." The match was applied at 2.30 p. m., July 20th, and the blast (1½ lbs., 800°) was put on at 10 p. m. the same day. The first cast was made on the 21st, and the manager hopes to continue making about 500 tons foundry iron per month.

The Harrisburg Car Manufacturing Company will soon commence on a new contract for the construction of one hundred cars for the New York Central Railroad. The old contract (three hundred cars) will be completed in about ten days.

Geo. W. Snyder's works, at Pottsville, are working night and day on two five hundred horse-power engines, for the Mammoth Vein Coal Company.

The tack factory at Wheeling started up on Monday, after being idle for a month.

It is reported that the furnace of the Topton Iron Company will soon be blown out.

Hussey, Binns & Co., Pittsburgh, are erecting a 24 pot Siemens furnace at their shovel works. This will add greatly to their facilities for making shovels.

Columbia proposes a manufactory of agricultural implements.

Shoenberger & Co , and Zug & Co., consume nearly the whole product of the nail keg department of the Pittsburgh Saw Mills, which produces about 1000 kegs per day on an average.

In our issue of the 15th instant we stated that the Tanite Emery Wheel Co., at Weissport, had shut down their works for a time for the purpose of enlarging their manufacturing facilities. We should have said the Lehigh Valley Emery Wheel Co., located at Weissport. The alterations referred to are now completed, and the company are running their factory on orders for the well known "Lehigh wheel."

MASSACHUSETTS.

Work at the Springfield armory has been resumed.

The works of the Kinsley Iron Company, Canton, are running again.

F. A. Brown & Co., of Pittsfield, have just turned out, at their new iron foundry, the largest casting ever made in that town. It is a plate of iron 12 feet long by 3½ feet wide and 5 inches thick, and weighs over 6500 pounds. It is for the Berkshire Glass Works, to be used in making plate glass, and is corrugated on the under side, to prevent it from splitting with the heat when the melted glass is poured upon it. It is made of charcoal iron. After leaving the foundry the surface is to be planed off at the works of William Clark & Co., on Depot street.

The Gosnold Mills, New Bedford, which have recently been stopped for repairs, will start up on Monday next. Orders sufficient to run the mills five or six months to come have recently been secured. The business of chain making has been added to that of iron rolling.

The Arms & Bardwell Manufacturing Company, Northampton, are making samples of Kellogg's patent skate, and expect soon to commence making them.

The Kitson Machine Co., Lowell, employ 175 men filling orders for their patent cotton openers and lappers. They are to furnish 13 machines for the new Wamsutta Mill, New Bedford; 8 machines for the Lockwood Company, Waterville, Me.; not to mention large orders from the Piedmont Manufacturing Co., South Carolina; the Trion Manufacturing Co., Georgia, F. H. Staffard & Co's Barrowsville Mill; the Annisquam Mills, Rockport; the Hookset Manufacturing Co.; the Vermont Mills, Bennington; the Blackstone Manufacturing Co., and others.

The Valley Machine Works, at Easthampton, are building a No. 9 steam pump, with a capacity of about 500 gallons per minute, for the American Institute Fair, at New York, next fall.

A Thompson 12 inch, steel-lined, rifled, breech-loading cannon has just been completed by the South Boston Iron Works. It weighs 82,280 pounds, or over a ton more than the famous Krupp gun exhibited at the Vienna Exhibition. The destination of the gun is supposed to be Sandy Hook, where a United States government commission are now engaged in testing and experimenting with heavy ordnance.

CONNECTICUT.

The Russell & Erwin Manufacturing Co., of New Britain, have given out the necessary contracts for buildings and machinery for the manufacture of screws. The buildings will be erected on land owned by the company, and adjoining their extensive hardware and lock factory. This important addition to the manufacturing industry of New Britain will, it is expected, be in full running order with capacity for the production of a complete assortment of screws by February 1st, 1876.

INDIANA.

The Indianapolis Rolling Mill Company are running double turn, and rerolled nearly 2000 tons of rails during the month of June.

The Union Lock Works, Indianapolis, have recently made shipments to furniture manufacturers in New York, Philadelphia, Buffalo and Cincinnati.

MISSOURI.

The Joplin Boiler and Machine Shop has received new machinery, and will soon be ready to do anything in the repairing of machinery, such as boring out steam cylinders, pumps and all kinds of lathe work; also, boiler and sheet iron work, and pump pipe of improved make.

The St. Louis Smelting and Refining Company has just closed the shipment of 70 tons of copper *matte* to an Eastern concern. It is not probable that such shipments will be often repeated. The company have it in contemplation to include copper smelting and refining in their purpose, and add to the present establishment the additional plant requisite. The recently constructed Flintshire furnace is working splendidly. In the few weeks of its run over 7000 pigs of lead have been produced from the by-products which this type of furnace was intended to treat.

Novelty in Refrigerators.

Mr. Alex. M. Lesley, of this city, has conceived the idea of a refrigerator which should combine at once the utility of a refrigerator and the elegance of a sideboard, suitable for even the most tasteful dining room, whereas the ordinary refrigerator is out of place except in the kitchen or cellar. The carrying out of this idea has resulted in a refrigerator having the exterior form of a sideboard, and possessing all the cooling qualities of the kitchen or zero refrigerator manufactured by him, and at a cost only double the latter.

It is constructed of solid wood, usually of black walnut and oak, the whole tasteful in appearance, being susceptible of any desired amount of ornamentation.

In addition to its appearance it has many advantages over the common refrigerator, such as freedom from the heat of the kitchen, and the unpleasant odors which attend cooking; beside, in a measure, cooling the atmosphere, which would be imperceptible in a heated kitchen.

The ice chamber being entirely separate from the contents of the refrigerator, the ice cannot possibly be affected by the various odors arising therefrom, while the waste ice furnishes from a faucet a constant supply of ice water for drinking purposes.

The milk and wine cooler, also a separate compartment, forms a very desirable feature of this refrigerator, and, together with the excellent arrangement of the principal portion under it, is complete and entirely satisfactory in its results

Connecticut Mica.

We have received from Mr. F. A. Hull, of the Hull & Belden Company, some remarkably fine specimens of mica taken from a newly opened mine near Danbury, Connecticut. The mica is of extraordinary quality, and if not as white as some we have seen, is remarkably free from checks and flaws. The vein is said to be of great extent, and blocks of unusual size are being taken out. The Danbury *News* gives the following characteristic description of the mine:

"The deposit or lead of mica was discovered about two months ago by the owner of the farm, Mr. Bates, while digging a cellar for a new house which he proposed erecting. The value of it was not then shown, as the specimens he extracted were very small and cloudy, and easily broken. But the indications of a 'rich find' were so good, he determined to call the attention of experts to the matter. In Danbury he found several, who visited the spot, made excavations, traced up the lead, and finally entered into negotiations for a lease of the farm to work the vein. Mr. Fred. A. Hull, of the Hull & Belden Company, became the lessee. He immediately began the work of getting out the mineral. He erected a huge derrick, capable of lifting the heaviest rock, dug a pit and struck a yet richer vein than the one first discovered. The last vein runs directly east and west, and although it has been followed up for a distance of nearly thirty feet, the end has not yet been found. An excavation of nearly thirty feet has been dug, and the mica grows better and better the deeper it goes.

"The value of it cannot yet be estimated, but that it is a perfect 'bonanza' cannot be doubted. When it is considered that this is one of the scarcest of all minerals, and that enough cannot be found to supply the stove trade of the country, some idea of its value can be obtained. Pieces five inches by seven are sold at from $3 to $6 per pound, and large pieces, a foot square, are worth a good deal more. So far as they have gone, the pieces average about eight inches square. We were shown one large piece, weighing, perhaps, twenty-five pounds, which was ten by eighteen inches, and which is worth about $10 per pound."

Thus far Mr. Hull has only taken out the mica in the rough, but will manufacture a large stock in anticipation of the demands of the stove trade next season. We understand that Mr. Hull desires to sell his lease, in whole or in part, on reasonable terms.

The Scofield Rolling Mill.—The Atlanta (Ga.) *Herald* says: Yesterday, while on our reportorial rounds, we stopped at the rolling mill to make inquiry about the resumption of work on Monday. We found the men well pleased with the prospect of work for next week. On going into the mill we heard Mr. Goodnow giving orders that allayed all doubts we had about the mill being put into active operation Monday. He told the foreman of the rolling department to have one furnace lit up to-day, to test all the steam pipes, and to put the blacksmith to work at once. He then notified all of the heaters to have their furnaces in readiness for work Monday. On being asked if he was going to have his iron puddled in Chattanooga, and keep the puddling furnaces closed as Mr. Scofield did the last month that he run the mill, he replied that he intended to run the whole mill day and night, and have all of his iron puddled in the mill. He intends giving all the men their old positions in the mill, and has even gone so far as to notify by mail those men who have left the city that work will be resumed in the mill Monday.

The Sharon *Times* says that the Westerman Iron Company have bought several hundred tons of muck bar from Middlesex and old rails from Youngstown, which indicates that those works are going to continue operations, and with increased energy.

GEORGE GUEUTAL & SON,

39 West 4th St., New York.

IMPORTER OF



Wood Screws, Steel in Sheets,



BAND SAWS, TOOLS FOR BRAZING, &c.

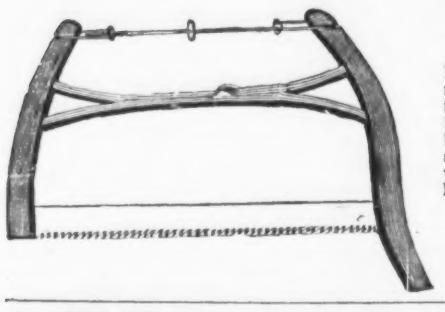
Bed Screws, Pin Hinges, and Wire Nails a Specialty.

H. W. PEACE,

MANUFACTURER OF

Saws of all kinds.

FACTORY, WILLIAMSBURGH, N. Y.



Elliptic Forked Saw Frame.

Patented June 28th, 1870.

The annexed engraving represents my ELLIPTIC FORKED SAW FRAME, which commends itself to the trade for its simplicity of construction. The Forked Brace being all in one piece, without any center bolt, secures for the Frame great strength and durability. These Frames are put up with my best Webs, marked "No. 40, Harvey W. Peace."

HARVEY W. PEACE,

Sole Proprietor & Manufacturer,

VULCAN SAW WORKS,

WILLIAMSBURGH, N. Y.

AMERICAN SAW CO.,

Manufacturers of

Movable Toothed Circular Saws,

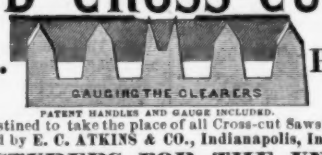
PERFORATED CROSS-CUT SAWS

And SOLID SAWS of all kinds. Trenton, N. J.

THE SILVER STEEL

DIAMOND CROSS-CUT SAW.

$1.50 Per Foot.



PATENT HANDLES AND GAUGE INCLUDED.

Patent Secured

THIS new Saw, which is destined to take the place of all Cross-cut Saws in point of **SPEED AND EASE**, is manufactured by **E. C. ATKINS & CO., Indianapolis, Ind.**, who are the

SOLE MANUFACTURERS FOR THE UNITED STATES.

So confident are we that this is the best Cross-cut Saw in the market that we CHALLENGE THE WORLD. Orders promptly filled.

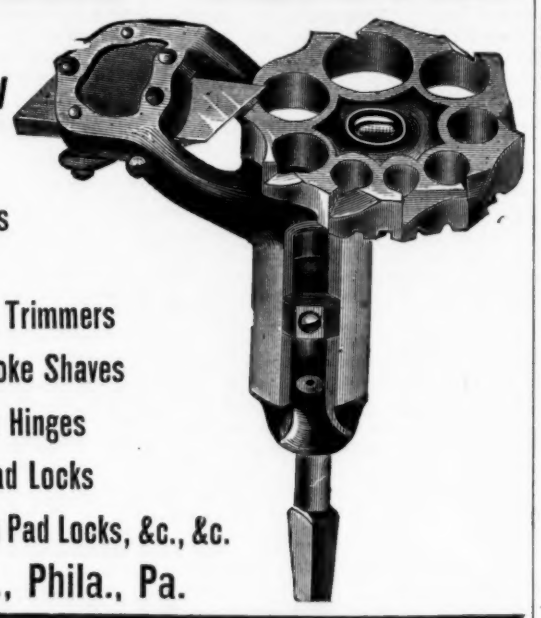
E. C. ATKINS. H. KNIPPENBERG. **E. C. ATKINS & CO.** Saw Manufacturers and Repairers, Indianapolis, Ind.

Lloyd, Supplee & Walton,

HARDWARE FACTORS.

MANUFACTURERS OF

Bonney's Hollow AUGERS.



Stearn's Hollow Augers

and Saw Vises

Bonney's Spoke Trimmers

Double Edge Sooke Shaves

Adjustable Gate Hinges

Scandinavian Pad Locks

Flat Key Brass and Iron Pad Locks, &c., &c.

625 Market St., Phila., Pa.

Machinery without Lubricant

METALINE.

Machinery Metalined, or Metaline furnished to Machine Builders.

No oil or attention required. Runs with little or no wear. No dirt or danger from fire. No damage to goods in process of manufacture. Years in use by best concerns, who are refitting old, and ordering new machinery to be metalined.

AMERICAN METALINE COMPANY,

61 Warren Street, New York City.



THE CELEBRATED

Yale Locks

FOR ALL USES.

Ornamental Real Bronze Hardware.

YALE LOCK MFG. CO., Stamford, Conn.

Salesroom, No. 298 Broadway, New York.

E. M. Boynton,

80 Beekman Street,

NEW YORK,

Manufacturer of

Saws of all kinds.

Also Sole Manufacturer of

LIGHTNING SAWS.

Two Direct Cutting Edges, instead of one Scraping point.



Note extra steel and durability over the old **V**, outlined on **M** tooth.

Telegram Dated Oct. 1st, 1874.

STATE FAIR, EASTON, PA.

To HENRY DISSTON & SONS:

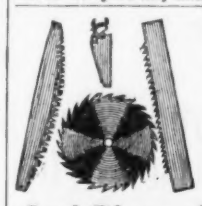
Philadelphia, Pa.

I want you to publicly test that challenge on Cross Cut Saws. Name time and place within thirty days. American Institute preferred. E. M. BOYNTON.

E. M. Boynton gave on Wednesday of last week an exhibition of what his Lightning Saw could do at the Pennsylvania State Fair, in which two men sawed through a sound oak log, 16 inches in diameter, in 17 seconds. Mr. Boynton informs us that his export trade is increasing, he having lately made large shipments of his saws to Australia and other distant markets.—*The Iron Age*, Oct. 8, 1874.

For fuller report of this exhibition see the *Easton Morning Dispatch* of Oct. 1st, 1874.

Henry Disston & Sons cannot furnish Lightning Saws. Why do they imitate mine?



J. FLINT,

Manufacturer of

ALL KINDS OF

SAWS

And Plastering Trowels,

ROCHESTER, N. Y.

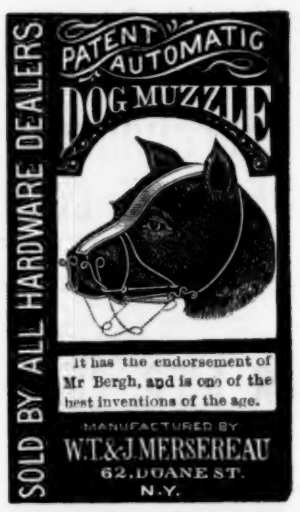
A large Stock of **Cross Cut Saws** constantly on hand. Orders filled promptly. **Dietrich's Double Handle One Man Cross Cut Saw** made with any kind of tooth desired. Our patent method of grinding Hand Saws makes them superior to any in the market. Send for Illustrated Price List.

Rogers' Self-Sharpening HOE.

The best Hoe in market. It will not batter or break. Wears itself sharp. Will last twice as long as any other Hoe, and is warranted to cut the "Bolles Hoe" or any Hoe in market.

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RUSSELL & ERWIN MFG. CO., - - New York.
BYRNE & FITZSIMONS, - - - - Albany, N. Y.
KENNEDY, SPAULDING & CO., - - Syracuse, N. Y.



Clement & Hawkes Mfg. Co.,

Manufacturers of

SHOVELS,

Planters' Hoes, Trowels and Machinery.

Northampton, Mass.

☞ Send for Circular and Price List.



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Successors to the

Woodruff & Beach Iron Works,

HARTFORD, CONN.

J. S. Hunter, Prest. E. J. Murphy, Treas. & Sec.

High and Low Pressure Marine & Stationary

STEAM ENGINES AND BOILERS,

Mining, Powder & Paper Mill Machinery,

And every variety of Iron and Composition Castings made to order.

The following are a portion of the Engines manufactured at these works, and are a sufficient guarantee of our capacity for doing first-class work, viz.: The Pumping Engines in the cities of Brooklyn, N. Y.; St. Louis Mo. and Hartford, Conn., and in the Charlestown, Mass. and Norfolk, Va. Navy Yards, and the engines in the U. S. Steam Sloops of War Michigan, Kearsage, Manitou, Minnetonka and Piscataqua and the Gun Boats Cayuga, Pequot and Nepsic, the Government Transports Dudley Buck and Geo. C. Collins, and the Steamships America and United States. Also the large Horizontal Engine for the new Plate Mill of the Bay State Iron Co.

WHEELER, MADDEN & CLEMSON,

Manufacturers of Warranted Cast Steel

SAWS

of every description, including

Circular, Shingle, Cross Cut, Mill, Hand, Roberts' and other Wood Saws,

&c., &c

Cast Steel Files

of the well known brand of

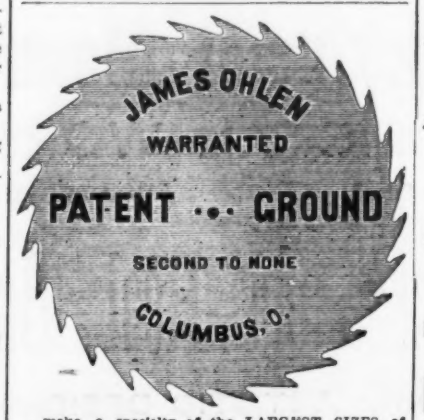
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Middletown, Orange Co., N. Y.

BRANCH OFFICE:

97 Chambers Street, New York.



make a specialty of the LARGEST SIZES of **Circular Saws**, and call particular attention of lumber manufacturers to the following points of excellence:

Evenness of Temper.—The peculiar structure of my furnace subjects all parts of the saw to a DEAD heat, and when dipped in the oil bath secures perfect uniformity.

Perfect Accuracy in Thickness.—My saws are ground on a patent machine, automatic in its operation, grinding off the thick places upon the plate before the thinner parts are reached, and when the saw is removed BALANCES PERFECTLY, which is proof positive of the right accomplishment of the work.

Properly Hammered.—Great care is taken that no saw shall leave my works without due attention in this important particular. A saw too tightly strained upon the rim, or too loose in the center, cannot be successfully run—hence the importance of so hammering the saw as to effect equal strain in all its parts, and at the same time RUN TRUE. This department is under the personal supervision of myself, who has devoted over *twenty years* to the art of saw making.

I am sole proprietor and manufacturer of the celebrated **"Challenge" Cross-Cut Saw.** Price Lists of all kinds of saws sent on application.

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V. G. HUNDLEY, Agent,

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Manufacturers of

AXE, PICK, GERMAN & AMERICAN SLEDGE, and other Handles.

Full assortment always on hand.

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SPEAKING TUBE, ELBOWS, ETC

Fitting up Speaking Tubes a specialty.

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The Axe for the Season of 1875 and '76.

H. CLARK'S CAST STEEL AXES.

Every Axe fully Warranted.



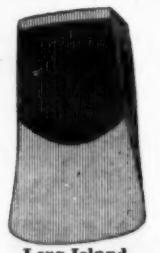
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BRONZED OR RED.

Price Per dozen..... .....$11 00 net cash. Beveled Axes.....50c per dozen extra.

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At each of these places a complete assortment of samples of Hardware and Fancy Goods will be found, including all new descriptions. Sole Agents for

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LE COUNT'S

Pat. Machinists' Tools.

REDUCED PRICES.

Set Iron Dogs,	⅜ to 2 in.	$ 5·60
" " "	⅜ to 4 in.	12·00
" Steel "	⅜ to 2 in	6·30
" " "	⅜ to 4 in.	13·00

Iron and Steel Clamps, Die Dogs, Clamp Dogs,

Vise Clamps, Expanding Mandrels, &c.

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South Norwalk, Conn.

JOHN MAXHEIMER,

Patented,

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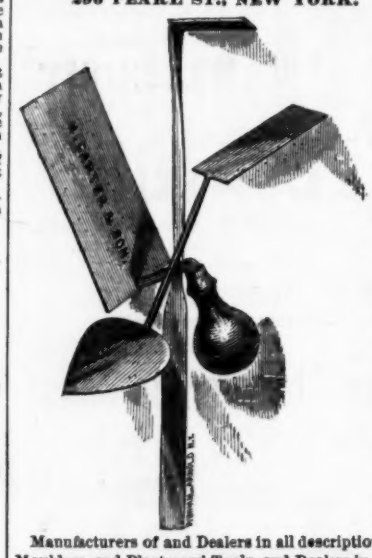
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Moulders' and Plasterers' Tools.

Manufacturers of and Dealers in all descriptions of Moulders and Plasterers' Tools, and Dealers in

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Cutlery.

John Russell Cutlery Co.,

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Manufacturers of

TABLE CUTLERY,

Butcher, Painters' and Druggists' Knives

IN GREAT VARIETY

Extra Hard Rubber Handle Table Cutlery of our own Manufacture.

Fine Ivoride Handle Table Cutlery, very White and Durable.

Sample Office, 77 Chambers St., N. Y.

NORTHAMPTON CUTLERY CO.,

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TABLE KNIVES AND FORKS OF **ALL** KINDS,

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And the **"Patent Ivory"** or Celluloid Knife. These Handles never **get loose**, are not affected by **hot water**, and are the most **durable knives** known. Always call for the Trade Mark **"MERIDEN CUTLERY COMPANY"** on the blade. Warranted and sold by all dealers in Cutlery, and by the MERIDEN CUTLERY CO., 49 Chambers Street, New York.

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PATENT FINE PEN & POCKET CUTLERY

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The **only Knives made** that are put together in such a manner that there is no strain on the covering or frail part of the knife. We warrant our knives equal in cutting qualities and workmanship to any made, and are acknowledged by English makers as the **Best American Knife.** We also make

NICKEL & SILVER PLATED POCKET KNIVES

which will not rust or become discolored when used as a Fruit Knife, and their cutting qualities are equal to any other knife. Orders filled from the factory, and in New York by **Messrs. J. Clark Wilson & Co.,** No. 81 Beekman Street (who have a full stock of all patterns always on hand), and also by **Messrs. G. B. Walbridge & Co.,** No. 99 Chambers Street.

Naugatuck Cutlery Co.,

Manufacturers of **FINE**

PEN and POCKET CUTLERY.

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Manufacturers of the following *Patented* Articles of

MALLEABLE IRON:

Hammer's Adjustable Clamps.

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For Sale by all the principal Hardware Dealers.

Malleable Iron Castings

Of Superior Quality made to order.



ESTABLISHED 1852.

NEW YORK KNIFE CO.

MANUFACTURERS OF SUPERIOR

Table & Pocket Cutlery,

WARRANTED TO BE MADE OF THE BEST MATERIAL.

WALKILL RIVER WORKS,

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AMERICAN PEN AND POCKET KNIVES,

MANUFACTURED BY Aaron Burkinshaw. (AB) *PEPPERELL,* MASSACHUSETTS

My Blades are forged from the best Cast Steel, and warranted. To me was awarded the GOLD MEDAL of the Connecticut State Agricultural Society; also a Medal and Diploma from the Mass. Mechanics' Ass'n Sept., 1869



Stretches the wire each way, is tightened with a common wrench, is self-fastening at each half turn of the spindle. Warranted for strength and durability. Sold at hardware stores generally. Byington & Northup, sole manufacturers, Rochelle, Illinois.

Agents: Hibbard & Spencer, Chicago; Excelsior Mfg. Co., St. Louis; John Nazro & Co., Milwaukee; George Tritch Denver; Nelson & Co., Burlington, Iowa.



ROMER & CO.,

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Manufacturers of **Patent Brass Pad Locks for Railroads and Switches.** Also, **Patent Stationary R. R. Car Door Locks. Patent Plan and Sewing Machine Locks.**

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80 CHAMBERS ST. NEW YORK
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WOSTENHOLM'S
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POCKET KNIVES,
KNIVES & FORKS,
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The demand for **Joseph Rodgers & Sons'** productions having considerably increased, they have, in order to meet it, greatly extended their Manufacturing Premises and Steam wer.

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Improved Flat Steel Key Pad Locks.

Passenger Car Locks, Bronze, Nickel Plated and Japanned.

For Railroad Switches, Freight Cars, &c.

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PHILADELPHIA CORRESPONDENCE.

PHILADELPHIA, July 25, 1875.

That we are steadily and rapidly progressing toward prosperity seems positively true. The dull times are terminated by a legitimate business cause in the export grain trade. The crops abroad are almost failures, while our own are up to and over the average, and the demand for our grain and flour has been such as to make a very active movement. Should this not be stopped by wild speculation in Chicago, we may look for a healthy fall trade from the very best source—the farmers themselves. The transportation of the crops will employ all the powers of the railroads, and will, in turn, create a demand for renewals of rolling stock, while the proceeds of the harvest will stimulate to new improvements, new tools to be purchased, new settlements, and increased vigor in all branches of trade. Monetary advices from abroad are favorable; the Centennial year will bring hundreds of thousands of foreigners to our shores, many of whom will remain and invest capital, or return to do so. The purchases of iron lands in the Southwest by English iron masters, at very low prices, has stimulated the desire abroad to buy largely of this kind of property, and invest capital in iron making here. Without being over sanguine, therefore, we may with reason believe that our country is about entering on a season of prosperity and advancement, entirely free from speculation and fictitious values, as in the war times, which will add greatly to our material wealth, and which may be expected to be of more than usual duration, since most of the panic causing elements will be absent from our business.

The statistics of the foreign imports into Philadelphia for the fiscal year just closed, show some interesting figures of values, and, of course, a steady decrease in iron. Of pig iron imported, the value was $347,655; bar iron, $66,847; old iron, $64,144; hardware, $13,045; anchors and chains, $30,809; steel, $145,218; machinery, $57,752. Tin plates were imported to the amount of $1,740,159, which shows the consumption here as most, if not all of this, was of direct importation in the American line steamers and used here. The total value of imports was $24,236,387, the total exports were $28,588,019, leaving a balance in our favor of $3,750,000. Our exports of grain and provisions increased largely, and of petroleum were well maintained. A new line of steamships to Rotterdam will commence business this fall, and another line will open direct trade with Mediterranen ports. A line of clipper ships has been established with San Francisco, to have weekly dispatch from this port. The demand for large sized vessels, adapted to the petroleum and grain trades, is unusually active, and all the available ones now here, and several bound here from European ports, have been chartered during the week at a decided advance in freights. Our coastwise trade is increasing rapidly. A new line of steamers for Brazil and the East Coast of South America is projected, and a very decided effort will be made by Pennsylvania manufacturers to establish a trade in our products with the South American Republics. Philadelphia is rapidly regaining her foreign commerce, and in connection with her numerous and varied manufactures, will ere long do an immense trade.

The New York *Post* declares that "the American ship-wrights have given up the attempt to build iron steamships," and, as usual, misrepresents facts to force an argument for free trade. Ocean steamships are principally now of iron, and four different yards on the Delaware are busy as possible on iron ships. Roach has three steamers of the largest size—one on the stocks and two launched and finishing. The other yards are also busy. Uraguay has an order with one yard here for three steamers, all iron, and one of which is a monitor. Nor is our wooden ship trade dead. Byerly, Hellman & Streaker and Neafie & Levy have lately completed two wooden steamers for the Haytien navy, of large size and heavy armament. The City of Philadelphia, a very large and fine wooden clipper, lately built in Maine for Philadelphia owners, is loading coal for California. The Centennial, another new clipper just finished at East Boston, and of 1286 tons capacity, is loading with miscellaneous freight here, also for California. The local wooden ship yards on the Delaware are all busy, as well as the iron yards, and the steamships of the latter, while built as cheap as on the Clyde, are so much better constructed that their rating at "Lloyd's" and the "Bureau Veritas" is always higher, while none of them built in the last three or four years have suffered from accident or wreck, although exposed to contact with ice and rocks in running action in several instances. The *Post* must get a fresh subject for its Munchausenism, and if free trade cannot succeed except at the expense of the prosperity of the American iron ship trade, it is dead beyond resuscitation.

The Centennial moves very briskly. The Memorial building is approaching completion; the work on the main Exhibition building, stipulated to be done August 1st, would have been done in time, but it is complained the Pencoyd Iron Works do not furnish the iron fast enough. Pencoyd has the reputation of prompt and thoroughly good work, hence, we presume, the stick is elsewhere. The Government Commission has just completed contract for its building, to be done January 1st, 1876, at a cost of $75,000, and in which the different departments will exhibit objects pertaining to each. The English Commissioners have broken ground for their four official buildings, for their headquarters; the Japanese Commissioners are about to erect suitable buildings for themselves in their own architecture; and Sweden and Morocco propose doing likewise. The Austrian government has cabled for one-third more space, or 32,000 square feet in the main and 21,000 square feet in the art gallery The French Commissioners have found that goods will be transported by the Trans-Atlantic Steamship Company, from Paris to Philadelphia, at a price two-thirds less than it cost to send goods from Paris to Vienna. Indeed, all the foreign peoples seem to take more interest in our success than many of our own States, and the lack of patriotism and plentitude of petty jealousy for fear some local advantage may be obtained by the city where the Exhibition is held, present a disagreeable phase of American character. The New York *Tribune* lately, in an article ostensibly solicitous for the success of the Centennial, but really designed to injure it, deplored the danger of a short water supply, and the great risk to exhibitors from fire. As it happens, the Centennial buildings will have their own distinct water works, furnishing 6,000,000 gallons daily for these alone, while there will be 12,760 feet of pipe in the buildings with 77 plugs or hydrants inside and 36 outside, while no point in the buildings will be 100 feet from a hydrant. These are official figures from the director. Moreover, we have water enough here to supply the Centennial and city both ten times over. After our Centennial is over, the spirit of certain Americans in regard to it during its preparation will be strikingly like the actions of the Tories in our Revolutionary War, and in our future history they will be classed alike. While writing of the Centennial, here is an item for the tin men who read *The Metal Worker*. The roofing required for the various buildings is as follows, viz.:

Main Exhibition building, square feet tin roofing	1,058,400
Memorial Hall	85,000
Western offices	28,000
Horticultural Hall	40,000
Machinery Hall	685,000
Agricultural Hall	271,000
Total square feet	2,167,400

This will require the roofing with tin of about 41 acres. In other words, we will have a good sized farm covered with tin roof as the covering of our Exhibition buildings. Now, let some one figure up the tons of solder this will take, the weight of the tin and its value, and then please to note that probably not one pound of it was made in the United States, while all of it could easily, and should have been, made here.

Schierloh's Cherry-Heat Welding Compound.

We have lately received letters of inquiry respecting the value of Schierloh's cherry-heat welding compound from readers in various parts of the country, claiming to have tested it with unsatisfactory results. The complaint in most instances has been that it would not make satisfactory welds at a cherry heat. The difficulty, probably, is that the term cherry-heat is used to describe any temperature between dull red and white or welding heat, and we have more than once explained the proper method of using this compound to insure the best and most satisfactory results. In reply to an inquiry from us, Mr. Schierloh sends us the following letter, which will be understood by all our readers who are interested in the subject:

PENCOYD IRON WORKS, July 21, 1875.

H. Schierloh, Esq., Jersey City, N. J.: DEAR SIR.—We acknowledge, with pleasure, receipt of your favor of 14th instant, bearing upon recent correspondence with yourself and Messrs. Pancoast & Maule, of our city, in regard to your "Cherry-Heat Welding Compound." In our last letter to these gentlemen, under date 15th June, we stated, we had been enabled through the additional instructions furnished in yours of 4th ultimo, to make a good weld at cherry red, but that in welding steel to iron at this heat, you found it necessary, as we did, to secure a fair white heat for the iron.

This is the instruction contained in your letter of the 4th of June, which we stated to Messrs. P. & M., "placed the matter in a new light," and gave us the proper mode of working when using the above articles.

We would not have had any trouble from the start with your compound, had your "Circular Letters" called the attention of consumers to the necessity of bringing the iron to a white heat; but, from carefully reading all that were issued from our city, we could not find that you desired this mode of handling. Everything pointed to bringing iron and steel to "cherry red," and at this heat we were unable to make satisfactory work.

Permit us to quote from your letter 4th ult., which will exhibit to others who may desire to know something of the merits of your compound, exactly how we are using it, thereby deriving, as we think, the best results. You say: "Heat a piece of iron to a good white heat, scale it, sprinkle on it a thin coating of the compound, and lay thereon a piece of cold steel; return to the fire (a hollow) and when the steel is no more than a cherry red, take out and weld under a steam or trip hammer, or under a flatter, if on an anvil, and the first two or three blows to be light." Following these instructions, we are prepared to recommend it as an excellent welding compound, cheaper and superior to borax or any other flux we have ever used, and as we said to Messrs. P. & M., "under the condition here stated, are perfectly satisfied to consider it a Cherry Heat Welding Compound."

Respectfully yours,
A. & F. ROBERTS & Co.,
Per THEODORE THOMAS

Tempering Mining Picks.

The San Francisco *Mining and Scientific Press* offers the following suggestions respecting the tempering of mining picks:

There is probably no service to which steel can be put, which so effectually tests its value, as in mining picks. The tempering of a pick is a very nice piece of work and should be done with great care. In the first place a good charcoal fire is necessary; next, good steel, and then a good light hammer with a smooth-faced anvil; and lastly, a man is needed with a good keen eye, considerable experience and excellent judgment. No good pick can be turned out if any of the above essentials are wanting in the process.

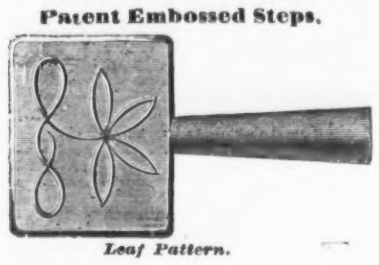
A pick should never be "upset," or hammered endwise, nor raised above a full red heat. The steel should be, moreover, heated as quickly as possible, as long exposure to heat—even if that heat is not in excess—injures its texture. Many blacksmiths find great difficulty in tempering picks, because they do not choose good steel. After being heated the pick must be worked with care, special pains being taken in drawing it out, to hammer on all sides alike, in one place as much as another, and on one side as much as another.

When ready for hardening, it should be heated in the blaze of a charcoal fire until red hot, and then plunged into cold rain water, and kept there until it is nearly cold; but if kept too long in the water or until it is quite cold, the corners are liable to fall off. Some blacksmiths use salt water; no salts of any kind should exist in the water, but the water should be cold; if the water is warm, and a little ice should be thrown in to chill it, the tempering will be all the better. Pure soft water for hardening will make a tougher pick, and one less liable to crack at the edges than where salt water is used.

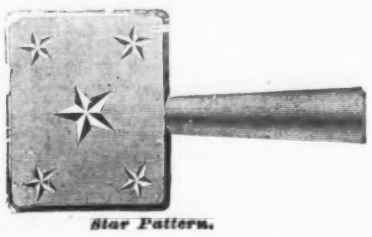
An old mining partner of the writer's, who always sharpened the picks at the claim, and was quite expert at it, used to hold the pick end in the water for just exactly a certain length of time until a certain shade of color appeared. Then he did not consider it properly tempered until the point was inserted in the ground and allowed to gradually cool. The last hammering of a pick should always be given on the flat sides, across close to the edge and then up each side about an inch. By so doing the corners will be less liable to crack off. The same process will work well with all edge tools. Good, well proportioned and well tempered picks in mining operations, are very important, and sharpening should never be intrusted to unskillful hands. Should the careful experience of any of our readers disprove anything of the above, or suggest anything new, we should be happy to report the same.

H. D. SMITH & CO., PLANTSVILLE, CONN.

Patent Embossed Steps.



Leaf Pattern.



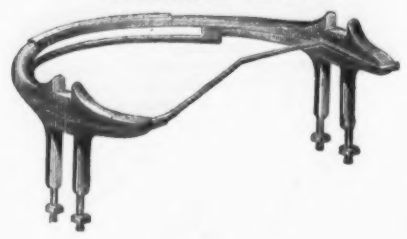
Star Pattern.

Established 1850.

King Bolt Yokes.



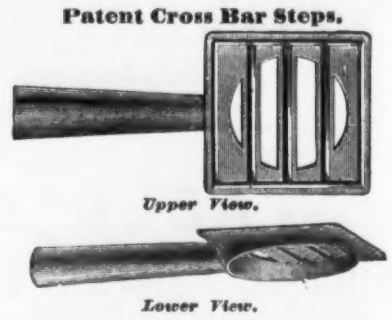
No. 6 Fifth Wheels.



1871 Pattern Shaft Couplings.



Patent Cross Bar Steps.



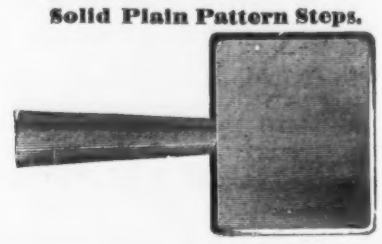
Upper View.

Lower View.

Smith's Improved Philadelphia Pattern Slat Irons.



Solid Plain Pattern Steps.



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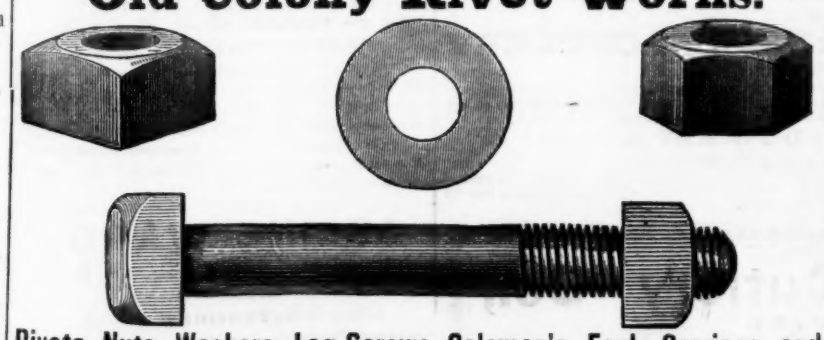
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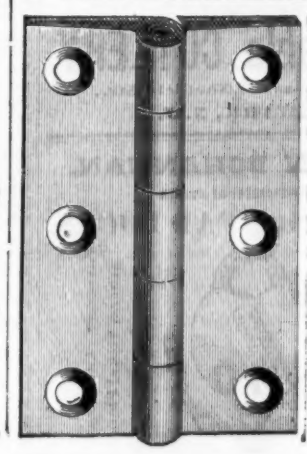
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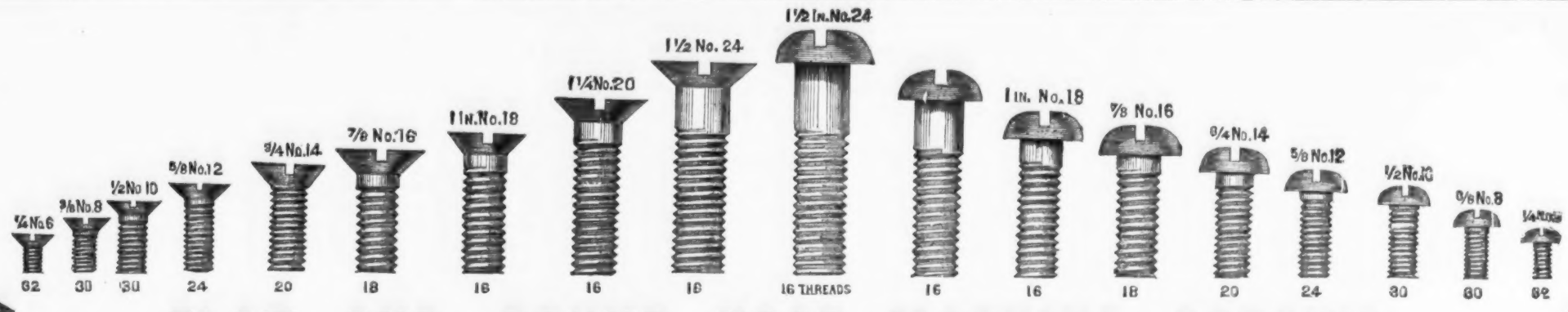
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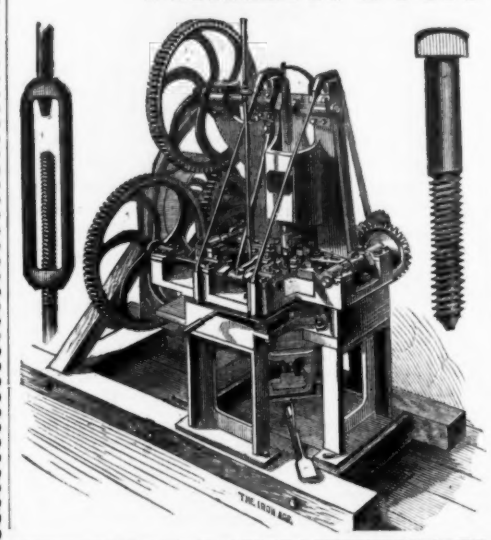
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New York, Thursday, July 29, 1875.

DAVID WILLIAMS - *Publisher and Proprietor.*
JAMES C. BAYLES - *Editor.*
JOHN S. KING - - *Business Manager.*

NEW YORK, January 2, 1875.

Until the 1st instant the postage on newspapers was paid by subscribers at the office where the paper was received, the yearly rates on the different editions of *The Iron Age* being as follows: Weekly, 40 cents; Semi-Monthly, 40 cents; Monthly, 24 cents.

Under the provisions of the new postal law, which went into effect on the 1st instant, prepayment at the office of mailing is required, at the rate of two cents per pound for the Weekly, and three cents per pound for the Semi-Monthly and Monthly, which will make the postage as follows on the different editions: Weekly, 50 cents; Semi-Monthly, 30 cents; Monthly, 15 cents.

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City Subscribers will confer a favor upon the Publisher, by reporting at this office any delinquency on the part of carriers in delivering *The Iron Age*: also, the loss of any papers for which the carriers are responsible. Our carriers are instructed to deliver papers only to persons authorized to receive them, and not to throw them in hall ways or upon stairs; and it is our desire and intention to enforce this rule in every instance.

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Seventh Page.—The Limit of Carburation of Iron. Refractory Clay for Lining Puddling Furnaces.

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The Situation and the Outlook.

From all the indications we think it safe to conclude that the reaction from extreme depression in the iron trade has already begun—though, it must be confessed, in a very small way. We rarely hear of furnaces blowing out; it is by no means rare to hear of them being blown in to meet an increased local demand for iron. Moreover, we see indications of a better feeling in the trade. The railroads are purchasing somewhat more liberally than for some months past, and the rail mills are anticipating larger orders as the season advances and the roads require to be put in condition for the winter traffic. The general consumptive demand does not seem to promise a very rapid increase between this and the end of the year, and it must be confessed that, if a better feeling does exist, it rests upon little beside the hope of future improvement in trade. At the same time, a majority of those in the trade with whom we have lately conversed seem to feel that the worst is past, and that any change must be a change for the better.

In estimating the prospects of general business for the remainder of the year, it is difficult to escape the conclusion that expectations of a great and profitable activity, if any such are entertained, will be disappointed. There is nothing now to warrant the hope that our consumptive demands will exceed the comparatively narrow limits of our actual requirements. As a people, we are just now somewhat despondent. Public opinion is widely divided on the question of what shall be done to unravel the snarl of our national finances, and maintain our credit unimpaired, without such measures of contraction as would prove disastrous in the extreme to our productive and distributive industries. The policy of the present administration, looking to an early resumption of specie payments, may never be carried out, and this failing, it would be difficult to suggest a treasury programme which would prove acceptable to the country at large. In the mean time the question is changing its character, and from a profound and difficult problem upon which only those who have given the subject intelligent and careful study dare venture an opinion, it is becoming a political issue, and the people of the country are gradually taking sides in favor of paper money or hard money, without any clearer idea of the consequences of extreme legislation upon either side than is gained from partisan and disingenuous discussion in the political newspapers and upon the stump. We have no doubt that order and right will come out of the present chaos of public opinion, believing as we do that the people will never entertain the idea of repudiation, and that no policy will receive the popular approval which does not look to the equalization of value between the paper dollar and the gold dollar, by the easiest and best of practicable methods. Pending any settlement of the controversy, however, it is natural that public confidence in the future should be somewhat unsettled, and that those with opinions which are not likely to be adopted by the people should feel and express distrust of the future. Everything favors the development of such a feeling. When we are busy and prosperous, we have no time for anything but buying and selling and getting gain; when times are dull, and we are uncertain upon which side of the dividing line between profit and loss we must write the net result of the year's business, we have time to grumble and growl and feel unhappy about a great many things which, at other times, give us very little concern. Under these circumstances, it would take a great deal more of commercial activity than we are likely to experience between this and the end of the year, to make us feel that we had no cause for complaint of the condition and prospects of business.

Next spring we may expect to witness a very decided change. The preparation for the Centennial will give us something beside ourselves and our troubles, real and imaginary, to think about. From the opening in May until the close in the fall we shall experience a great deal of very pleasant and, under the circumstances, beneficial excitement. From self deprecation we shall pass, by natural and easy methods, to the most comfortable and satisfactory kind of self-glorification. Our Fourth of July will extend over nearly half a year, and the most uncompromising croakers will find it difficult to resist the influence of national pride and good feeling. Glorying in the past will beget pride in the present and confidence in the future. This of itself will be most favorable to a quickening of the pulse of trade, but it will not stop there. The whole nation will go to Philadelphia, which will also be the center of attraction for the whole world; and in the pleasures, activities and excitements growing out of the Centennial, we shall forget the past, and venture as liberal an expenditure as our purse will warrant, notwithstanding our present resolve to economize to the last cent, even if it ruins us. In a word, we may reasonably expect to forget our doubts and fears during the excitements of a year which will bring us the Centenpial and presidential canvass, and we may expect to see a decided revival of all legitimate enterprises, if not of reckless speculation. We cannot but think that the Centennial is likely to prove in this way of vastly greater benefit to the country than its original projectors imagined It is just what we need to give us a new forward impulse, and to beget that confidence which is so slowly restored when once shaken. All this is conjecture, merely, but it rests upon a probability so strong that our business men can well afford to extend liberal aid and encouragement to the Centennial. Great international exhibitions have always been the means of attracting large amounts of foreign capital, as well as of putting in more active circulation the capital held at home, and whatever will accomplish these results for us at this time should receive the support of all classes of the public.

Railway Accidents.

Mr. Fred. C. Danvers, C. E., in an article written for the *Quarterly Journal of Science*, discusses at length the English railway accidents of the past year, and comparing them with the accidents of previous years, draws from them some lessons as to the best means of preventing the occurence of accidents in the future. England may almost be said to have dedicated her railway system with an accident, and though for a few years she showed a very considerable immunity from them, as compared with the number which occurred in this country, yet she now seems to lead, and will probably continue to do so for some years to come. After giving a brief history of English legislation upon the subject of railway accidents, he takes up the matter of the responsibility of railway companies for accidents, and compensation to passengers for injuries received. At the time of his writing a commission was sitting to consider how railway accidents could best be prevented. The Board of Trade is from time to time investigating the management of railroads and making recommendations relative to the management of them. A more foolish plan could hardly be imagined, because the Board of Trade and its officers are not railway men. Their advice and recommendation is of a general character, while the requirements of roads are almost as various as the roads themselves. In general the directors are better able to deal with the prevention of accidents than outsiders. It is very well to investigate and find out what caused the accident and hold the company responsible, but there leave the whole matter. Responsibility in pecuniary damages will do more to make traveling safe than all the coercive measures possible.

What the character of the British railway management is may be gathered from the fact that, in 1872, out of 238 accidents, negligence, want of care, or mistakes of officers, were apparent in 180 cases. The great effort of English railway officers and of the Board of Trade seem to be directed toward making the running of railway trains an automatic matter, and to deprive it as much as possible of the character of an operation needing intelligence. Mistakes of officers caused an accident, let us therefore have the "block" system and be independent of intelligence, and rely upon a machine. Upon this system they largely rely, and to this system they look for safety in the future.

While this system may be good, the principle is essentially wrong, and we apprehend that, as railway management is better understood, human intelligence will be more and more depended upon, and mechanical devices made to act a less and less important part. The expense of the various systems, as applied to the English roads, is something simply enormous, and the worst of it is they do not by this really insure security. Mr. Danvers says: "The more serious accidents are evidently "upon the increase, more particularly from "collisions within fixed signals at stations "or sidings, and from passenger trains be- "ing wrongly turned or run into sidings, "or otherwise through facing points" (switches). This must certainly be encouraging to the English passengers, and must be still more so to the companies who are spending enormous sums on the block system and various interlocking systems of working switches. In 1872 the number of accidents in England had increased 44 per cent. over 1871, 88 per cent. over 1870 and 196 per cent. over 1869.

The following are some of the directions in which improvement will, in the opinion of the Board of Trade, tend to the safety of railroad trains:

1. The judicious selection, training, and supervision of officers and servants, and the preservation of good discipline.
2. Maintenance in high condition of the permanent way.
3. Good design, construction and material of axles.
4. The application of tyre fastenings which will prevent the tyres from flying off the wheels in the event of fracture.
5. Improved coupling of vehicles in trains.
6. Signal and point arrangements with modern improvements, including concentration and interlocking of the signal and point levers, and locking bolts and locking bars for facing points.
7. Safety points to goods or siding connections with passenger lines.
8. Increased use of the telegraph, with block telegraph systems for securing intervals of space instead of illusory intervals of time only between trains.
9. Sufficient siding accommodation for the collection, distribution and working of goods traffic, so that goods trains may be shunted and marshalled independently, and kept out of the way of passenger trains, and may not encumber and endanger the traffic on the main lines.
10. Continuous breaks, to be worked by the engine drivers as well as the guards, as occasion may require.

One important point, and one needing especial attention upon English roads, is entirely overlooked in this enumeration, and that is the construction of the railway rolling stock. In this direction English management is very weak, and many of their accidents could be traced to this cause if they would but examine closely enough. Before English accidents loose their fatal character, English railway cars must have an altogether different character. It will be found that in case of accident to the Pullman trains, the American cars will come out in much better condition than the English cars of the same train.

Mr. Danvers considers the several means of increasing the security of railway traffic under the following headings, viz.: 1. Efficiency of Staff. 2. Maintenance of Permanent Way. 3. Maintenance of Rolling Stock. 4. Signals and Points. 5. Telegraph, and the Block System. 6. Siding Accommodation. 7. Break Power.

The first of these seems to have attracted the most attention. Opinions on this portion of the subject vary greatly. The President of the Institution of Civil Engineers thinks that the arrangements of block signals and the like tend to make the engineers less watchful, and more careless as to the state of the road between signals. Capt. Tyler thinks exactly the reverse. There is evidently something essentially wrong in the management, we may say radically wrong, for the blame seems to be of such a character, and to involve so much in principle and so large a number of railway officers, as to be inexplicable, unless the system itself is wrong.

In discussing the question of the maintenance of the permanent way, a state of things is revealed which would startle an American engineer. While the road bed in first construction receives the most careful attention, and is prepared with the greatest skill, yet the maintenance is often of a character that makes accidents probable. A good deal of this is doubtless due to the characteristic conservatism of the English railway managers, who are proverbially slow to adopt improvements. In the maintenance of rolling stock, tires and axles require the most care. In 1873 there were 23 accidents resulting from defective tires, attended with great fatality. In this country we seldom have wheels or axles break under passenger cars, and when they do we expect nothing more serious as the result than a loss of time in the running of the train. Defective signals and bad management of switches, or "points," is the principal cause of accident in Great Britain. In 1873, there were 178 accidents from this cause, and the proportion seems to be annually increasing. As the signals become more and more complicated and switches multiply, the danger becomes greater; and, although the interlocking system is coming into general use, and promises greater security, we have yet to learn how it will work when the machinery becomes worn. In the matter of brake power, the English railway trains are inexcusably deficient, and the managers of the lines, as well as the scientific and technical writers for the newspapers, seem to have no idea of the requirements of a power brake. Mr. Denvers, for example, recommends an increase in the number of "brake vans" and of brakemen, instead of recommending the employment of apparatus by which each car might be made to stop itself. The American system of train brakes will undoubtedly be adopted in England. From present appearances, they are not likely to adopt the best system first. In a large number of the United States it is required by law that every car should have a brake, and in the general matter of the application of brake power we are probably far ahead of any other country. Power brakes of excellent and simple construction are coming into very general use, and by means of these, the engineer acquires so perfect a control of his train, that he can stop it almost as suddenly as if he had run it into a stone wall.

From the foregoing it will be seen that of all the causes of accidents enumerated by Mr. Danvers, only one contributes in any material degree to increase the danger of railway travel in this country. That is the neglect of the proper maintenance of permanent way. Our lines are long, and the number of section men employed is usually so small that they cannot attend as closely to road bed and track as is necessary to safety. Another cause of frequent accident is found in the management of freight traffic—employing too few men and over-working them, and running freight trains at too high a speed to keep them out of the way of passenger trains. On many roads it is a notorious fact that the freight trains make the fastest time between stations, in order to make up for the loss of time in switching. In the matter of rolling stock there still remains much to be done before the highest standard of uniform excellence will be reached. On roads which are crowded with traffic to anything like the extent to which the great English roads are crowded, double or quadruple tracks become absolutely necessary to enable the work to be done on time and without accident.

The English Panic.

Prof. Bonamy Price, of Oxford, has written a letter to the Indianapolis *Sentinel*, explaining the causes of the recent financial crisis in England. Prof. Price's explanation has the merit of directness and brevity, and will be found of interest to our readers:

The half-crisis in the London banking market has obeyed the universal law of all crises. There has been, first, a destruction of capital, and then, secondly, a scare in the banking market. Who is to bear the losses?

I. Wealth has disappeared chiefly in matters connected with the iron trade. Bad business has been going on for a long time. The iron made has far from reproduced the capital which it cost to make; and capital not reproduced after its consumption means impoverishment, diminution of actually existing wealth. There has been a large consumption of food, clothing, materials and tools by the workers in iron; the iron produced has not fetched back equivalent corn from America, wool and cotton from divers countries, meat and butter from England, and so on. The nation is poorer, fewer things in it, smaller means for sustaining future industry. This waste had been going on for a long time undiscovered. Houses engaged in some other trades had run a similar career. Business ended in losses, which must never be regarded as a diminution of money, but of goods, of wealth, which money only places in different hands.

II. Then came the day of discovery, the day of settlement and alarm. The firms which had continued on these operations stopped at last; and then the banking community found itself loaded with pieces of paper, bills, which it had imagined could command the money expressed upon them. This was a revelation of nothing short of bad banking. Agitation and alarm immediately sprang up. Who would have to bear the losses, and to what extent would they run? It was discovered that there had been clever machinery at work by which penniless people had put two or more names to worthless bills, drawing upon one another without any property to pay the sums they were pledged to, and then had contrived to get these bills discounted by a considerable number of banks—that is, had sold these bills to these banks and obtained the money for them. The banks had been overreached. They had not had the wit to perceive that these were bad bills with worthless names upon them, and, as is alleged, palmed upon them by clever rogues. The banking world then felt very uneasy. How far was the revelation to proceed? How many of the bills discounted by bankers and bill brokers would prove to be worthless pieces of paper? We were very near upon a real crisis; but the mischief stopped short of one, because it was gradually perceived that the loss fell upon banks able to bear it, and not likely, by failing themselves, to extend the agony as to how many persons who had given credit to others would have no chance of being repaid. The banks have been very smartly bit by their eager, reckless, and bad banking. Then the evil ended in the money market, and alarm calmed down. The loss of capital to England caused by the consumption of wealth in the iron and other trades, which was not replaced by goods of equal value produced, remains; time alone can cure that.

We have no doubt this is a very fair and correct statement of the causes and consequences of the panic. The question is, however, if the root of the trouble lies in the unprofitableness of iron manufacture, where can it be expected to end? The loss of so large a share of her export trade in iron and its manufactures, has seriously affected the general prosperity of Great Britain, and will permanently retard the industrial progress of that country. England's only advantage at this time consists, as regards iron manufacture, in superior plant and an abundance of skilled labor. Other countries are now rivaling the former in excellence, and emigration is steadily, though not so rapidly as in past years, drawing off the latter. We have immeasurably the advantage of Great Britain in the matter of fuel and ores, we are steadily improving our furnace and mill plant, we lead the world in the use of labor saving machinery for working the iron into useful articles, our labor supply is becoming already superabundant in the iron making districts, and present adversity is teaching us a close and systematic economy which will enable us to steadily reduce the cost of our iron. On the Continent the progress of iron manufacture is rapidly forcing English competition out of the market, and occasioning the British manufacturers no little inconvenience at home. In short, it is evident that British supremacy, as regards the iron trade, is now successfully contested by other countries, whose aggregate production goes far toward supplying the world's requirements. Fortunately, Great Britian is by no means dependent for existence or commercial greatness upon her iron industries, and so long as she can secure an adequate fuel supply at home and abroad, she can continue to support her population and add to her already vastly accumulated wealth. This cut off, she must at once receed from her present proud position among nations—a calamity of which there is little danger in this century, at least.

The failure of Duncan, Sherman & Co., though creating a temporary excitement in the market, will not produce consequences of a serious character. The firm have suffered seriously from a decline in cotton. The liabilities of the firm amount to some five or six millions of dollars, which is

widely distributed here and in Europe. A considerable amount is due on travelers' letters of credit. The local deposits are not as large as formerly, but are by no means inconsiderable. The assets show a heavy deficiency, and it is feared a heavy loss will fall upon the creditors. The amount of unpaid foreign bills is not large, say not more than £100,000, distributed among a large number of holders. In our financial article we give a further account of the causes and consequences of the failure.

Recent Developments in the European and American Copper Markets.

Since our last editorial on copper, dated June 24th, a material change has occurred in the general aspect of business on both sides of the Atlantic. While confidence has received a severe shock in Europe, and especially in England, in consequence of numerous heavy failures deeply affecting the metal trade, it has been reviving here ever since the beginning of the current month in a manner no less striking.

Although we had been assured over and over again by financial dispatches from England that the weak concerns in the India trade had all failed, another important failure in the Ceylon trade was announced as late as Saturday last, and it is fair to presume that we have not yet seen the end of these commercial disasters. Since the opening of the Suez Canal to steam navigation the transactions in India produce in London have been about doubled. The old method of valuing against shipments at six months' sight was resorted to by these financially weak concerns more than ever before.

Fortunately for the copper trade between Chili and London the drafts are 60 and 90 days' sight, thus excluding "kite "flying;" but as many of the tin operators were also importers of copper, their losses on tin have hastened realizations upon the latter metal, and a decline from £82 for Chili bars to £80 has thus been caused since the commencement of the month.

Leaving out the 334 tons afloat from Australia, and 3600 tons afloat from Chili, as advised by cable, the visible supply of copper in England and France on the 1st instant stood thus:

	Tons.	Price of bars.
Stock, afloat and chartered	30,084	£82
Against 1st July 1874	32,275	78
" " 1873	39,856	80
" " 1872	37,447	104
" " 1871	41,239	67

The average supply during the five years was, it will be seen, 36,180 tons; the deficiency was, therefore, 6096 tons, which in normal times would have been deemed an excellent statistical position, even if the deliveries had been less satisfactory than than they have been all along. But as the entire metal position there has been vitiated during the month by the developments we have alluded to, even the best statistics go for nothing, and a further drop may be impending.

It is all the more welcome to producers and holders here that at this juncture we can be but little if at all affected by the course of prices in Europe from the moment the copper and brass trades of the United States give unmistakeable evidence of a speedy, and, we trust, vigorous revival, as has been the case for the past week or two. What we were able to conveniently spare them has been secured by the Europeans while the gold premium was high; the balance we have shown on various occasions we can take care of ourselves, provided there be no serious check on consumption, which is not apparent.

The "scene" which Mr. Plimsoll created a few days ago in the British House of Commons, upon the statement by Mr. Disraeli of his intention to withdraw the bill presented by that gentleman for the protection of sailors against the criminal practices of a large class of British shipowners, was certainly unparliamentary, but it accomplished the result desired. Public opinion, which has sustained and encouraged Mr. Plimsoll from the first in his humane crusade against the sacrifice of life in unseaworthy ships, has responded with hearty approval to every word of his bitter denunciation of those who, by active opposition or passive indifference, have placed obstacles in the way of securing such legislation as is needed for the better protection of life at sea. With all their constitutional conservatism, the British people love an honest and unselfish reformer, especially when he makes every sacrifice of personal interest to attack vested abuses, and engages single handed in a fight which calls for the display of a high degree of moral courage, combined with unwavering tenacity of good purpose. For many years Mr. Plimsoll has devoted his best efforts to securing the reforms needed in the laws governing the shipment of sailors and the insurance of unseaworthy ships, and with all England, so to speak, behind him, he can afford, when moved by righteous indignation, to shake his fist at the Prime Minister, and launch a curse at the "scoundrels," in and out of Parliament, who are in league with the unprincipled ship owners to defeat legislative inquiry and render reform impossible. Mr. Plimsoll may have to apologize for the language used by him, and this he can do without sacrificing his dignity or that of his cause; but he has won an honorable victory by vigorous means, and the fact that Mr. Disraeli has announced that Mr. Plimsoll's bill will not be withdrawn, shows that if he does not fear that gentleman, he does fear the force of public opinion, upon the favor of which the existence of his ministry is dependent. This little incident is comparatively unimportant in itself, but it affords substantial encouragement to all honest reformers, whose labors are judiciously directed against real evils. Mr. Plimsoll, with the British people behind him, can snap his fingers at Mr. Disraeli and all his cabinet, and demand, by an authority higher than that of royal warrant, that a righteous and needed law shall be passed.

Notwithstanding all the illnatured criticism which has been passed upon our Centennial by the English newspapers, English manufacturers are likely to make a very good representation at that little show. Among the last to accept the invitation of the President addressed to foreign governments, England is the first to begin the actual work of getting ready. On the 22d instant, ground was broken at Fairmount Park under direction of the British Commission, preparatory to the erection of four buildings for the use of British exhibitors. Other nations are about to follow the good example without delay. The Japanese Commissioners will shortly begin the erection of buildings for exhibits from that country, as will those representing Sweden, Morocco and other countries. Austria has also sent forward a requisition for space which calls for 32,000 square feet in the main building, and 21,000 in the Art Gallery. This looks as if the foreign exhibitors are likely to crowd the domestic exhibitors.

Centennial Preparations.

The Philadelphia *North American* says:

The season of preparation for next year's Exhibition is fast wearing away, yet there are many who still seem to cling to the delusion that "there is plenty of time." So far is this from being the case that every one who purposes exhibiting ought not merely to know to-day precisely what he will bring hither next winter, but he should have given to the Centennial Commission such thorough information about it as to enable those charged with the work of installation to fix upon the location of his exhibit. The allotment of space, we learn, will be commenced within a few weeks, and, in order to proceed with it, it will be necessary to suspend receiving further applications for space. This will probably be done about the 1st of September, so that those who fail to engage space within the next six weeks will be in a fair way to find themselves excluded from the Exhibition.

So far as private exhibitors are concerned this is their own affair, and they will be the only sufferers from their delay. But there are others on whom the preparation of an adequate Exhibition has devolved as a matter of official duty, and whose neglect of it will deservedly be reprehended. Throughout the past three years, but more especially during the last eighteen months, the governors, legislatures and commissioners of the several States have been frequently advised of the part it became them to take. As a general thing these appeals have met with responses which, if not as prompt as they should have been, are on the whole satisfactory. To be explicit, we may say that the governments named below have made the appropriations specified, either as contributions to the cost of the Exhibition, or toward the arrangement of collective displays of their own natural, agricultural and other resources:

Philadelphia	$1,575,000	Illinois	$10,000
Pennsylvania	1,000,000	Michigan	7,500
U. S. government	505,000	Arizona	5,000
New Jersey	110,000	Arkansas	5,000
Massachusetts	50,000	Indiana	5,000
New York	25,000	Kansas	5,000
Connecticut	25,000	Montana	5,000
New Hampshire	20,000	Colorado	4,000
Nevada	20,000	Wisconsin	3,000
Ohio	13,000	Oregon	1,000
Delaware	10,000	Minnesota	500
Wilmington, Del	5,000		

In fairness it should be added that there are other States than those above named—Nebraska, Tennessee, Iowa, Oregon, Rhode Island, California, for instance—in which the work of representation has been undertaken by duly qualified boards, which are likely to make as creditable displays as those which have been officially endowed. On the other hand, some of those which have adequate funds at their disposal have given little or no sign of using them, and others are at this moment only commencing the work which ought already to be matured.

Now the officials who have been thus remiss ought to understand that the day is coming when, willing or not, they must give an account of their stewardship. The constitution of the Exhibition is such as to involve not merely a comparison of the industries and resources of the United States with those of other nations, but of the relative standing of the several States one with another. Visitors from abroad, and indeed our own people, will be apt to assume that the State which gives no evidences of industrial prosperity or natural resources has none to show; and the visitor from a State whose honor and interests have been thus disregarded will seek with some bitterness to ascertain whose negligence has brought humiliation on his commonwealth.

It is just as well to understand frankly, and from the outset, that there are in every State three men to whom the credit of a good exhibit, or the responsibility of a discreditable one, will be primarily attributable. These are the governor and the two United States Centennial Commissioners. The first from his position, the others because of their acceptance of the office, lie under obligations both to their State and to the country at large from which they cannot be exonerated except by their creditable discharge. The work of preparation has been thoroughly laid out and set in motion at the central office of the Commission, and it is now the duty of the Commissioners to see that it is carried out in their several States. It is best that, even at this late day, this should be distinctly realized, to the end that Commissioners who have been content to wear the honors of their office while shirking its labors, should bestir themselves to retrieve the wasted hours and escape a disagreeable reckoning next year.

English vs. American Manufacture.

The following comments are translated from *La Houille*, a French paper published in Paris:

If there is a spectacle worthy of attention, it is that of the metallurgical industry of England at the present moment. It is hardly ten years since—at the time of the exhibition of 1867—the industrial power of England was at its hight. No nation could compete with her in the cheap production of iron and steel; her implements were without a rival, and her mineral power appeared to ensure for her a long period of cheap raw material. Among her principal contributors she placed America, France, Germany and Russia. If, at the termination of the coal crisis of 1871-2, any indications were manifested on the spot of the possible exhaustion of her resources, and an advance in the cost of raising coals, no one on the other side of the Channel would have dared to predict what has since been revealed. Who would have really forseen that North America, which imported then from six to eight thousand kilometres of rails (about five-eights of a mile) annually, would so soon render herself perfectly independent of the English works?

This fact, appearing at a moment when England, lending her ear to the reports of her agents, saw magnificent horizons opening up before her, constitutes a revolution of a nature to discourage a nation less energetic than the English.

With the desire to ascertain the real position, Mr. Bell, the President of the Iron and Steel Institution, was requested to make a most minute inquiry into the metallurgical industries of America, and, in consequence, a grave and serious fact has been revealed, which is, "that America found, not only in the inexhaustible resources of her soil, but also in the eminently ingenious and enterprising spirit of her labor, the principal elements of the prodigious competition in which we are engaged. In fact, the most perfect and newest appliances in the manufacture of steel is no secret to them, and, what has been still more unexpected, it is on the other side of the Atlantic that the greatest efforts are made to arrive at an economical use of combustibles. Thus it is proved that in the majority of forges in North America the puddling was effected at the rate of 1050 kilogrammes (rather over a ton) of coal per ton of iron produced—a wonderful result, which is mainly due, they pretend, to the system of double furnaces lately introduced. This system has been equally applied in England, and has produced results still more considerable, since in the furnaces of Lord Dudley, at Round Oak, they have arrived at the enormous proportion of 7 to 7½ metrical quintals of coal for one ton of iron produced. But our neighbors, like ourselves, proceed with a certain amount of hesitation, following up our old errors, making a mystery of everything, while in America all the establishments have their doors thrown wide open to anyone who wishes to make inquiries and gain knowledge. Thus it is that the unheard of rapidity with which all progress is generalized in America is easily explained, while in Europe it is so often 'localized' to the great detriment of public good. We wish to call the attention of our working classes to some most important facts at the present moment, when on the eve of the opening of the great exhibition in Philadelphia."

Everyone must impress on his mind the result of Mr. Bell's inquiry, which is this: "America is to-day not only an essentially agricultural and mining country, she is an industrial one of the first order, from which France and England have much to learn. Let there be no mistake; America tends more and more to free herself from old Europe, not only in producing as cheaply as ourselves objects of first utility, but still more in giving to her productions the finish and perfectness which appeared likely to be for a long period yet an appanage of the old continent. This last consideration touches us particularly, we having only retained up to the present time that enormous and magnificent market, thanks to the good artistic taste of our workmen. Continuing the same strain of ideas, we are happy to be able to bring to the knowledge of your readers a fact which denotes the point to which the spirit of enterprise and commercial intelligence has been awakened amongst us. They may remember that about two months since we expressed a desire to see French capital employed to a certain extent in the acquisition of German or English mining property, so as to utilize our savings in the release of the enormous tribute which we pay each year to the foreign producers. This wish has been realized in a measure on this point, for we understand that the largest fuel factory in the whole world—that of Messrs. Cory, Yeo & Co., of Swansea—has become, under the direction of a group of financiers and eminent practical men, the property of a "limited" French company, with a capital of millions (francs of course), under the name of "The Graigola Merthyr Coal Company."

Mutuality of Interest Between the Producers and Users of Metals.

In an address delivered not long since at a banquet of engineers, Mr. A. L. Holley made the following sensible remarks, which we are glad to be able to find space for in our columns:

If there are two professions in the world which should be bound together by mutual professional interests, they are those which represent the producers and the users of metals. They should recognize each other as the chief and co-ordinate members of the same great department of practical science.

The civil engineers have carried their particular arts and sciences to such high development that the miners and metallurgists acknowledge their dependence upon them at every step; but, at the risk of lecturing the civil engineer a little, I cannot refrain from telling them that some of them do not, we think, sufficiently appreciate the benefits which may accrue to themselves, as well as to us, if they would familiarize themselves a little more with the working details, as well as the general principles, of the metal manufacture.

We think that they should spend more time in studying the adaptation of metallurgical processes to the production of those physical characteristics that they require in metals, and we very earnestly ask them to better understand the possibilities and economies of the forge and the rolling mill. When we take a student fresh from an engineering school, we expect him to design some machinery that cannot be built at all, and a good deal that cannot be economically built. His judgment must be matured by familiarity, not only with mathematical formulæ, but with foundry practice, and with machine shop practice, and with the economics of transportation, erection and repairs; so that he can make a judicious compromise between the various difficulties he will encounter, to the end that he may learn to build machines and structures that shall be cheap as well as good.

Is it not equally proper to ask of constructing engineers at large, that they shall, for the same reason, and to an equal extent, study the difficulties of the iron and steel manufacture, and make its economies a more important element in their design?

There certainly are instances in which engineers not only harrass the manufacturers of materials, but defeat their own ends, by specifying products in accordance with engineering formulæ only, ignoring the economics, if not the possibilities, of production.

When we consider the splendid achievements of modern engineering—truss and arch bridges of 500 feet span; foundations sunk through rapid rivers and the drift of ages of the solid rock; machines that are almost human in their automic operation; whole navies of ships that steam their 15 knots an hour without closing throttle for weeks together, the locomotives, the tunnels, the lighthouses, the break waters, the harbors, the water works, the ship canals, and all the monumental engineering of the time; and then, when we consider the gigantic strides of modern metallurgy, by means of which many of these engineering feats have rendered commercially possible—the Bessemer process, in 1855 an almost abandoned experiment, in 1875 producing a million tons a year; the Siemens-Martin process, the offspring of a single decade, and already the rival of the Bessemer; when we contemplate the machinery, by means of which a handful of boys can perform the work of a regiment of men; by means of which ponderous and blazing masses of steel are smoothed into the infinite forms of utility, like clay in the hands of the potter; when we observe the chemist prying open the ultimate molecules of matter, and assorting and weighing their constitutents; and the metallurgist by means of scientific synthesis, recreating what the chemist had dissociated; when we consider all these co-ordinate and splendid achievements of engineering and metallurgy, it seems to me that the two organizations which represent them may renewedly and more harmoniously in the future press forward that great work to which they have, more than all agencies, contributed in the past—the establishment and maintenance of the ways and means of civilization.

On DeHaen's Process for Purifying Feed Water.

In a meeting of engineers of the Lower Rhine district some additional points of interest were elicited in regard to this method of purifying the water intended for use in steam boilers. J. Schummelbusch stated that he had only favorable reports to express. The precipitation of bicarbonate of lime by means of lime, he remarked, only takes place when warm, say about 122° F. The precipitate which is formed by lime alone, as well as that produced by chloride of barium alone, settles very slowly, so that, as a rule, 24 hours are requisite. If both precipitants, one after the other, be added to the water to be purified, the water above the sediment is clear in 20 minutes. Stirring up the portion of the precipitate which falls first, hastens the clearing. The whole process, inclusive of letting in the water, only takes an hour. The water is perfectly free from substances that produce incrustations, and only contains a very small quantity of lime in solution.

Hanke stated to the Magdeburg Verein that after the introduction of the DeHaen process he had noticed light flakes in the glass, which shows the hight of the water, and the slime drawn out of the boiler proved on analysis to be lime. This showed that too much lime had been added to the Elb water used for feed, and that the lime, although soluble at first, was deposited as the water evaporated. The cost of purifying 2½ cubic meters was 38 pfennige (about 10 cents) for three pounds chloride of barium, and with lime about 45 pfennings, while no saving of coal was perceptible.

Dr. Duerre remarked that Elb water contained so little carbonate of lime that very little milk of lime was required to decompose it, and that the small quantity of milk of lime with a too small precipitate were not sufficient to envelope the sulphate of baryta. Water dissolves quick lime, and one kilo of lime in 1000 kilos of water goes into the boiler in clear solution to be precipitated again there in flakes on evaporation. The waters of the Elb contain so little lime (0·1 part to 1000 parts of water) that water purified by DeHaen's process would enter the boiler with 7 to 10 times as much lime in it as if it had not been purified. Beside this, the process is too expensive, and the use of soda is at all events preferable. The latter is not used enough; he has used soda in his own boiler for 1¼ years, and has had so little incrustation that it was not possible to knock it off. If 135 kilos of chloride of barium of 90 per cent. be required, it would only need 60 kilos of soda of 90 per cent. No foaming of the water in the boiler was noticed when soda was used; the chloride of barium in De Haen's process is more likely to cause it. In this process if too little chloride of barium or too little lime is used the water remains turbid; strong stirring separates the baryta from the lime and makes the water milky again; too much chloride of barium causes a useless waste in this expensive process, and too much lime forms slime in the boiler. The process also depends on correctly carrying it out, and a certain amount of practice on the part of the workmen. The purification with soda requires about one-half to three-fourths of an hour to obtain five-sixths of the precipitate, if the water is sufficiently warm.

Others also stated that the process mentioned was not suited for Elb water. Baumann remarked that the addition of chloride of barium must be regulated according to the hight of the water in the Elb, as the quantity of gypsum varied with the rise and fall of the river, because the pumps of the water works draw simultaneously from the Elb and from other sources.

The Hudson River Tunnel.

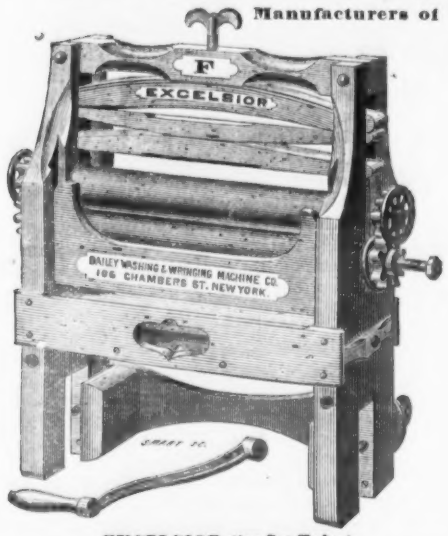
The Hudson River Tunnel enterprise has been embarrassed by legal difficulties almost since the project was first started. Last November the Tunnel Company began work at the foot of Fifteenth street, Jersey City, at the point then determined upon as the terminus. The Morris and Essex, and the Delaware, Lackawanna and Western Railroad companies claimed an interest in the land where the work was carried on, and soon after obtained an injunction against the Hudson Tunnel Railroad Company, and stopped the work. The latter company made application to Judge Depue for the appointment of commissioners to condemn so much of the land, where the company was at work, as might be required for the tunnel, in the manner prescribed by the general railroad law. Judge Depue appointed R. C. Basot, James L. Ogden and J. M. Cornelison, commissioners to assess the value of the land to be taken. The two railroad companies mentioned then applied to the Supreme Court for a writ of certiorari, to test the legality of the appointment of the commissioners. Chief Justice Beasley, of the Supreme Court, delivered an opinion sustaining the appointment of the commissioners.

In the meantime Mr. Cornelison, one of the commissioners, died, and it became a question whether the Board of Commissioners was dissolved by the death of one of them, or whether another commissioner was to be appointed to fill the vacancy. The Tunnel Company therefore made application to Judge Depue to appoint other commissioners, or one other, to fill the vacancy. Friday, at Newark, was appointed for the hearing of the application for the appointment of commissioners, or a commissioner. Jacob Vanatta, counsel for the Delaware, Lackawanna and Western Railroad, obtained, on Thursday last, an injunction from Chancellor Runyon, restraining the Hudson Tunnel Railroad Company from making any application for the appointment of commissioners, and from carrying on any operations upon the land in dispute until a full answer is made to the supplemental complaint of the two railroad companies. The counsel of the Tunnel Company, Mr. White, went to Newark, on Friday, and asked for an adjournment of the case until Sept 7, as far as the Morris and Essex Railroad Company was concerned. Meanwhile, he will attempt to get the injunction dissolved. He has, he says, two or three ways of obtaining relief, but had not yet decided which to adopt.

The Blair Process at Cleveland.—The Cleveland (Ohio) *Trade Review* says: There is some prospect of inaugurating an enterprise in Cleveland, which, if carried out, will add greatly to the importance of its iron metallurgy. It relates to the manufacture of iron and steel direct from the ore, without the use of the blast furnace or the process of puddling or cementation. The enterprise is in the hands of a few leading gentlemen of spirit and capital, who are giving the subject thorough study, and investigating the work as done at the Blair mill, in Pittsburgh, and they will probably at an early day make a decided move in the matter. The advantages of this process are great enough to at once command the attention of all iron manufacturers. The cheapness and simplicity of the plant, the very greatly reduced expense occurring from the absence of blast and puddling furnaces, and the greater likelihood of obtaining pure iron by reason of the fact that the reducing temperature is not great enough to carry the impurities with the iron, are features which must commend themselves with the greatest force to all iron men. We hope our Cleveland friends will succeed in speedily accomplishing all they propose to.

BAILEY WRINGING MACHINE COMPANY, 106 Chambers Street, New York.

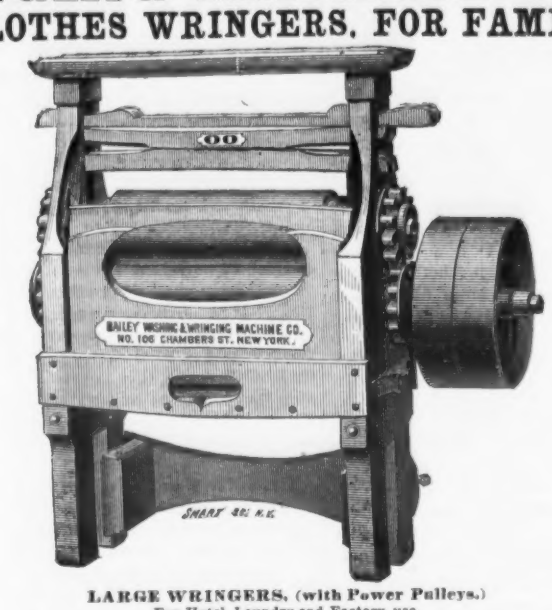
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No. G,	" "	11x2¾	11 00
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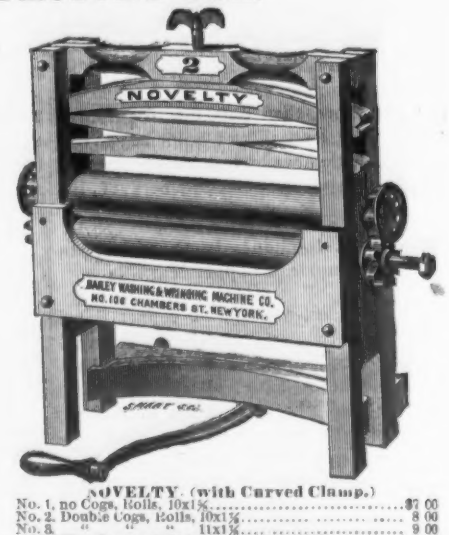


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NOVELTY. (with Curved Clamp.)

No. 1,	no Cogs, Rolls,	10x1¾	$7 00
No. 2,	Double Cogs, Rolls,	10x1¾	8 00
No. 3,	" "	11x1¾	9 00

☞ The above will fit tube 1¼ inches thick

NOVELTY (with Straight Clamp.)

No. 1¼,	no Cogs, Rolls,	10x1¾	$7 00
No. 2¼,	Double Cogs, Rolls,	10x1¾	8 00
No. 3¼,	" "	11x1¾	9 00

☞ The above will fit tube 2 inches thick.

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Under Billing's Patent Process.



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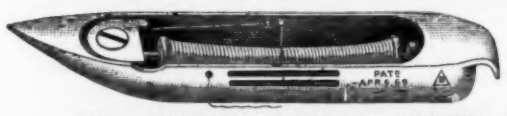




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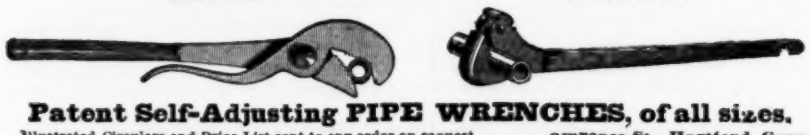
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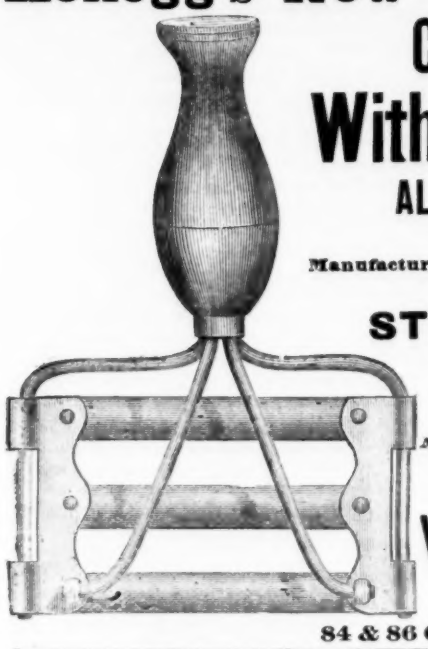
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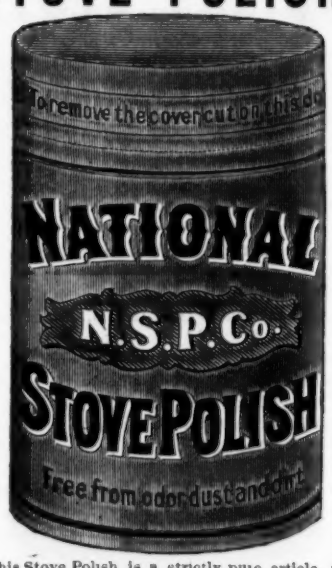
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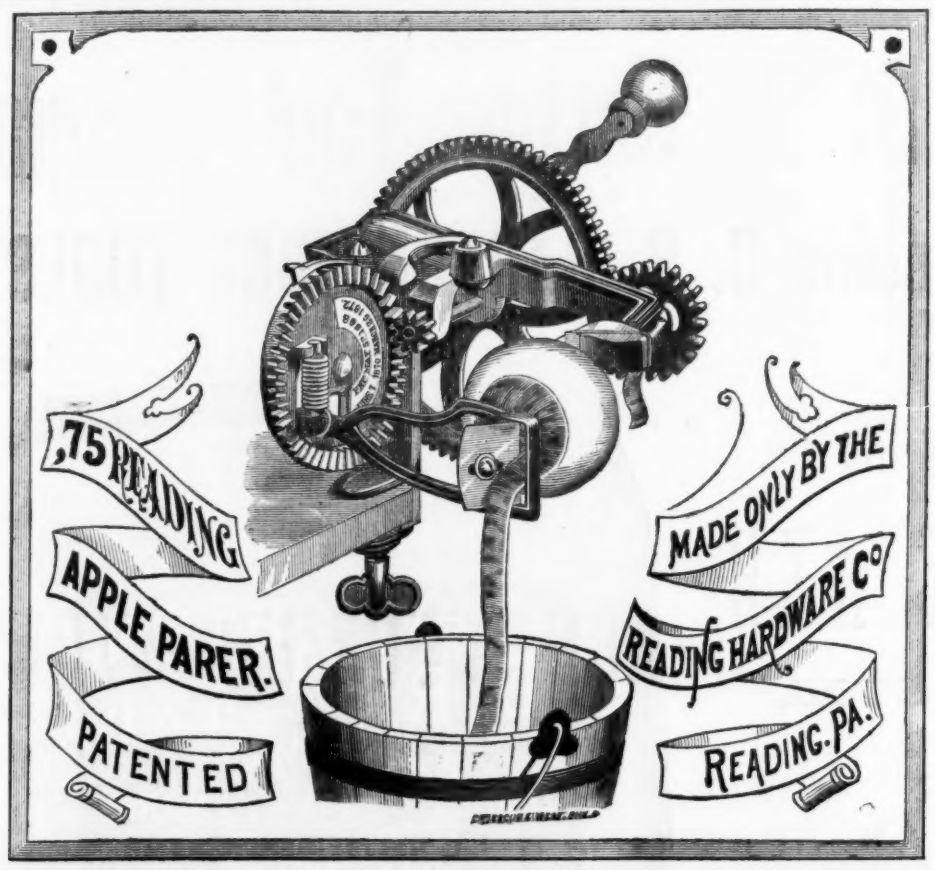
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NOVELTY ICE BREAKER.

THE BEST IN USE.



SAVES TIME, ICE AND ICE BOX,

Having Four Steel Points, it Splits the Ice without Wasting. No Pounding with the Hand.

IT SHOULD BE SEEN AND USED TO BE APPRECIATED.

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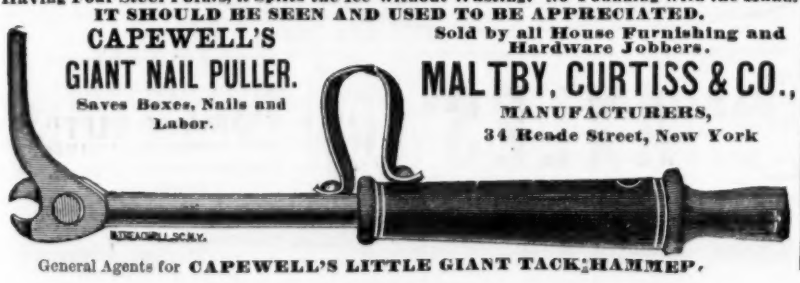
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With Water, Wine and Milk Cooler, is the best Meat, Fish, Fruit, Ice and Health Keeper in the World. 30,000 in use. Call or send for catalogue.

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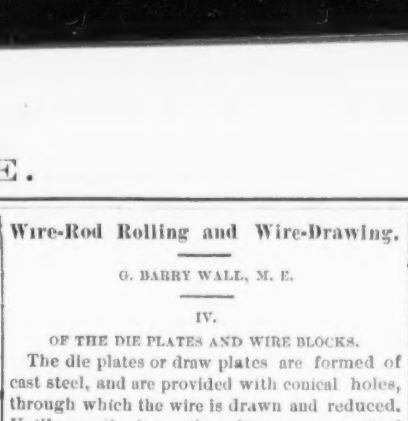
Wire-Rod Rolling and Wire-Drawing.

G. BARRY WALL, M. E.

IV.

OF THE DIE PLATES AND WIRE BLOCKS.

The die plates or draw plates are formed of cast steel, and are provided with conical holes, through which the wire is drawn and reduced. Until recently, it was thought more economical to import the plates from England, than to use those made in this country. The holes are accurately gauged to the size required, and are kept true by the workmen, who test them at intervals with small steel rods. When the holes become worn by continued use, they are battered up, and properly punched to gauge. In the course of a series of experiments, made recently by Mr. William Hewitt, of the class of '74, and the author, upon the resistance offered by wire to being drawn down, the effect of different inclinations of the sides of the conical holes, was particularly noted. A piece of No. 6 charcoal wire, well annealed, ·195 of one inch in diameter, was drawn to No. 7, ·179 of an inch in diameter. First, through a plate, in which the taper of the holes was very light. The amount of power required to draw it down was 516·6 pounds. Next, a piece of the same grade and size, with the same amount of reduction was drawn through a hole with a very heavy taper; the amount of power required being 766·6 pounds; showing a difference of 250 pounds in favor of the light taper. Arrangements will be made at an early date, so that an extended series of experiments may be made upon the effect of "coning" of the holes, and to determine, as far as possible, the most suitable inclination for the most efficient drawing of wire. The wire blocks—see cut—consist



of cylindrical cast iron drums, in which the bottom, the drum, the flanges and the collar, in which revolves the spindle, are all cast in one piece. Square holes are cut in the bottom of the block, for the reception of projections or horns on a revolving cam, which is firmly fastened to the vertical spindle. The block is capable of sliding vertically up and down on the spindle, and can rotate freely in either direction about the same, unless the projections of the cam are engaged with the apertures in the bottom of the block. A simple disengagement gear is provided to keep the block clear from the clutch when wire is not being drawn. Bevel gearing transmit the power from a horizontal to the vertical spindle, and thence by means of the projections of the cam, to the block. A gripper, consisting of a pair of tongs held by a chain, and being impelled by the revolution of the cam, draws the wire through the draw plate, sufficiently to allow of its being taken by the workman and fastened to the outer portion of the drum by means of the clamp. When the disengagement is freed, the block engaging with the clutch is thus set in motion; drawing at the same time the wire, which is coiled upon the drum, as the latter revolves. In making the calculations for the proper proportions of the block and gearing (which are unnecessary in this paper), we base our calculations upon the resistance offered by wire to being drawn down. The diameter of the spindle gear wheel should be as near that of the block as is convenient, so that there shall be the least amount of twisting of the spindle. The diameter of blocks, and velocities in feet per minute, for the different sizes of blocks, are given as follows: Diameter of ripping blocks, for drawing from No. 2 to 4 and from 4 to 6, 26 inches; number of revolutions per minute, 24; velocity in feet per minute, 163·32. Diameter of blocks for No. 6 to 9—two drawings—22 inches; number of revolutions, 32; velocity, 184·28 feet per minute. For sizes 9, 10, 11, 22 inches, 43 revolutions; velocity, 345·51 feet per minute. Sizes 15, 16, 17, 18, 22 inches, 86 revolutions, and 495·13 feet per minute. For sizes from 18 down blocks of smaller diameter and making 90 revolutions per minute are used. The above figures are not arbitrary, but are from the average results of experience.

OF THE LAW GOVERNING THE RESISTANCE OF THE DRAWING OF WIRE.

The amount of power required to draw wire never having been determined, it was suggested that some experiments might, without any great expenditure, be made upon the subject, and from the collected results deduce a law or laws relating to the resistance offered by the wire in being drawn. Upon application to Mr. Hewitt, of the Trenton Iron Company, his consent was obtained to make the experiments at the works of the above company. In their machine shop an apparatus for making these experiments was constructed. It consisted of a large steelyard balance properly mounted in an upright frame, fixed upon a heavy wooden frame of the form of a double cross; a casting somewhat similar in form to the old-fashioned rail chair was bolted to the frame. This casting was flanged so as to hold the draw plate firmly in position. Immediately over this and fixed to the shorter arm of the steelyard was a gripper for holding the wire, and at the proper time for drawing it, at the further end of the lever, was placed a spring balance, in connection with a long screw, capable of working in a nut—fixed to the frame—and moved by means of a hand wheel. The draw plate being fixed in its proper position, the wire—being at first pointed and forced through the holes in the plate—was seized by the gripper. The hand wheel was then turned until the wire was being drawn freely, or rather steadily through the plate. The indication of the pointer on the spring balance was carefully noted, care having been taken to balance the apparatus properly. Before taking the indications of the scale, the wire was started by lowering the lever, by means of the arms usually provided, with large balances, seizing the wire and again raising the lever. This was done in order that the extra expenditure of power required at the start should not vitiate the results. An experienced wire drawer, Wm. Wood, saw to the drawing of the wire, battering of the plates and gauging the holes, Mr. Wm. Hewitt, of Trenton, and the author applying the power by means of the hand wheel, taking the indications of the scale and accurately measuring the specimens before and after drawing.

Specimens of charcoal wire, carefully cleaned and annealed, were at first tested. The specimens were drawn only one size at a time, so that, dealing with comparatively small amounts of power, greater accuracy as to results might be obtained. A piece of No. 4 charcoal wire was first drawn to No. 5, *i. e.*, from ·235 of one inch to ·207 inch, the amount of power required being 1100 pounds. It will be observed, by reference to tables of sizes of wire, that the specimens tested were all a little full. The calculations and tables showing the results of the series of experiments are omitted.

A curve expressing the law of the resistance may be constructed by laying off co-ordinate axes, and on the vertical co-ordinate measure distances representing pounds or amounts of resistance; on the axis of abscissæ lay off distances representing the diameters of th different sizes of wire. By proceeding in this manner we obtain a curve having certain few irregularities, which are accounted for by differences in annealing, and by the want of uniformity in the gauge and in the texture of the wire. By taking the mean of the irregularities we may obtain a curve of great uniformity. On the supposition that we could go on, *ad infinitum*, reducing the wire, and each time measuring the size and resistance, we see that the curve would have an asymptote in the direction of the axis of abscissæ. Similarly, the curve would have asymptotes in the direction of the axis of ordinates. It remains, therefore, in order to arrive at the "general law of the resistance," to determine the form of the curve. By computation we find that the resistance in pounds varies as the squares of the diameters or as the areas of cross section of the wire. Expressed by a formula the law would be interpreted as follows: Resistance in pounds, divided by the diameter square of the wire, or by the area, equals a constant. By means of geometrical methods the curve obtained was shown to be an hyperbola. The irregularities previously referred to cause slight differences, which tend to make the law only approximate. If an extended series of experiments could be made—several trials being made upon the same sizes of wire—the law would undoubtedly come out perfectly accurate.

STEVENS INSTITUTE OF TECHNOLOGY, Hoboken, N. J.

Iron Trade Matters at Columbia.

The Columbia (Pa.) *Spy*, prints the following local gossip of the iron trade:

The fires were started in Kauffman's furnace on Monday, the 12th inst., the blast put in on Tuesday morning at 1 o'clock, and on Tuesday the first casting was done. The furnace is working very well, and is turning out the usual quantity of iron of excellent quality. It is to be hoped that the iron market will be active enough to enable Col. Kauffman to keep the furnace in blast continuously.

The three Shawnee Furnaces, of the Chestnut Hill Iron Ore Company, are still out of blast, and great quantities of pig iron are stacked in the yard.

The Susquehanna Iron Company's rolling mill is running full handed, day and night turn. There are very few mills in the country that have as good a record as the Susquehanna, and this signal prosperity and uninterrupted activity during these unprecedented dull times, speak well for the management. Orders are pressing, and the company is maintaining the distinction, and the reputation for superior iron, long ago established, and so handsomely recognized by the Franklin Institute in the award of the highest silver medal.

Over the river, the Wrightsville Iron Company's Aurora Furnace is in blast, and working satisfactorily.

Perrottet & Hoyt, founders and machinists, Columbia, are unusually active for this season of the year, and are filling large orders for castings, machinery, &c. Among these are comprised the completion of the Columbia Gas Works for the manufacture of coal gas; castings for gas works for some point in the west; the iron work for the First National Bank at Marietta, and a lot of general job work. The firm have more orders on hand than at any other time during the year.

The Supplee Steam Engine Co., successors to Supplee & Bro., has completed its organization, called in the first installment of its capital stock, and commenced operations on Monday, July the 12th. With large working capital, increased facilities, and a reputation long established, its operations must be successful.

Messrs. C. B. Grubb & Son's St. Charles and Henry Clay furnaces are both in blast and working satisfactorily. They consume large quantities of Cornwall ore. Mr. Jacob Eckman and his son, Edward Eckman, are the managers.

At Chickies, Messrs. E. Haldeman & Co. have two furnaces in blast—Chickies Nos. 1 and 2. One of Watts' Marietta furnaces is also soon to be put in blast.

Messrs. Becker & Reinhold are running the Chickies rolling mill day and night. They are puddling iron and making muck bars for E. Haldeman & Co., for the New York and Boston markets. We are pleased to note this activity at Chickies.

The hollow-ware works at Marietta are doing an unusually brisk trade for this season of the year.

The other three furnaces at Marietta are out of blast, but the outlook is more favorable than could have been expected under all circumstances.



TACKS & SHOE NAILS made by the AMERICAN TACK COMPANY.

FACTORY, Fairhaven, Mass. - - SALESROOM, 117 Chambers St., N. Y.

Upholstery, Gimp, Brush, Card, Pail and Cheese Box Tacks; Leathered, Tinned and Iron Carpet Tacks; Bright and Blued Finishing Nails; Cigar Box and Chair Nails; Trunk and Clout Nails; Brads, Patent Brads, Copper Tacks and Nails; Iron, Zinc, Steel and Copper Shoe Nails; Polished 2d and 3d Fine Nails; Roofing and Slating Nails; Roofing Tacks and Tinned Tacks and Nails of every variety. Any size or style of Tack or Nail made to sample. Orders sent to either Factory or Salesroom will receive prompt attention.

The EUREKA "Perfected"

SELF-ADJUSTING



Simplest, Best and Cheapest Clothes Wringer in the World.

Steel Elliptic Springs.

T. J. ALEXANDER,

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Office, Oliver St. cor. High, Boston, Mass.

AMES' GENUINE CHESTER EMERY

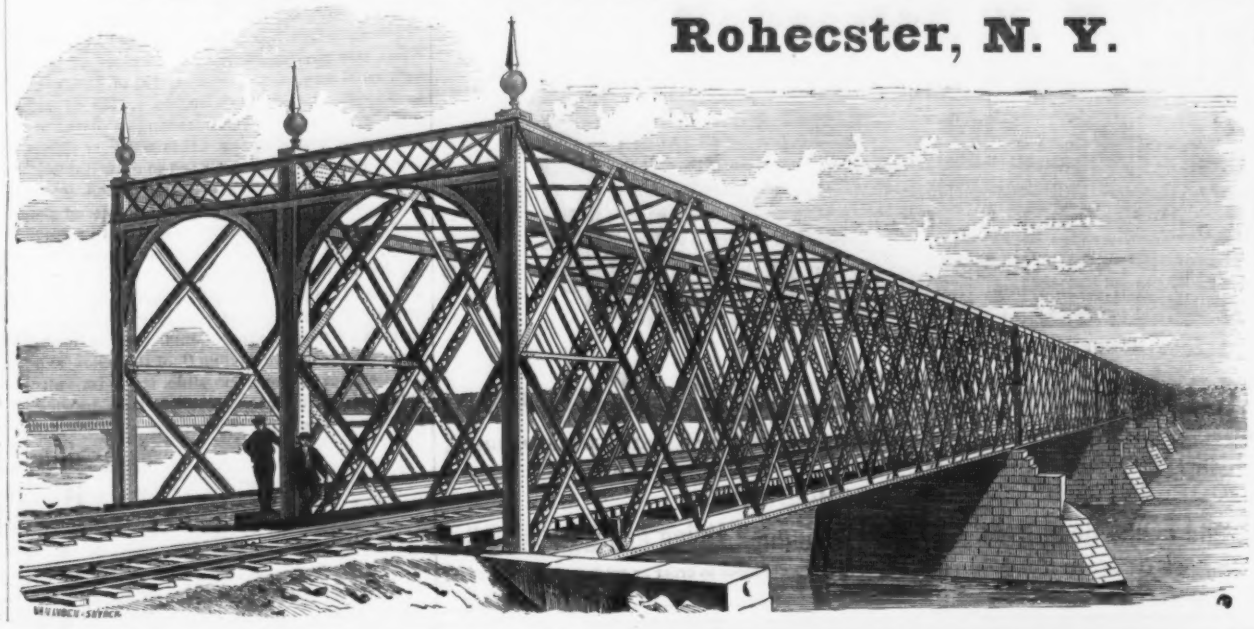
has been reduced from 7c. to 6c. per lb. for grains in kegs. Flour and Fine Flour remaining at 4c. per lb., as heretofore. Important discounts to the trade. Send for Circulars.

E. V. HAUGHWOUT & CO.,

26 Beekman Street, New York.

LEIGHTON BRIDGE AND IRON WORKS,

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Wrought Iron Riveted Lattice Railroad

AND

HIGHWAY BRIDGES.

Wrought Iron

WATER PIPE,

The most economical and durable Pipe manufactured for Water Works, Oil Lines or Gas Mains.

General Riveted Work

Orders solicited from Civil Engineers and Contractors.

[Accompanying engraving represents the Springfield Bridge, built by the Leighton Bridge and Iron Works.]

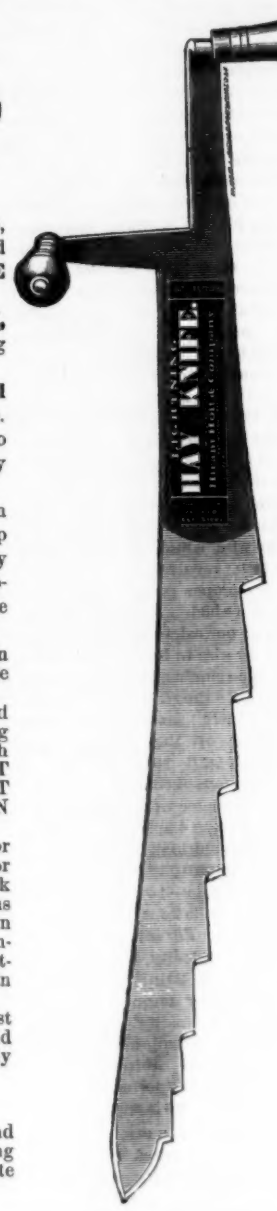
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Lightning HAY KNIFE,

Manufactured only by

HIRAM HOLT & CO.,

East Wilton, Franklin Co., Me.



The Lightning Hay Knife is a perfect success, and is acknowledged by all who have tested its merits to be the **BEST HAY KNIFE** in use.

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The cutting surface being small it is kept in order much easier than the old smooth edge knife.

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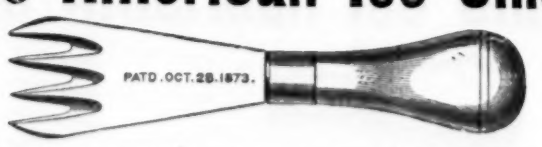
It is not only valuable as a Hay Knife for dividing stacks and mows, but is a superior instrument for cutting hay from the bale, stack or mow, and corn stalks into fine feed, thus doing the work of hay cutters much faster than any other hay cutter in use. It also stands unrivaled by any implement yet invented in cutting peat, turf and muck, and ditching in marshes and meadows.

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Axes, Picks and Hatchets.

Lightning and Lightning Conductors.*

(Concluded.)

Mr. Cromwell Varley, in the old form of single needle coils, simply twisted together the two ends of the coil wire before they were attached to their proper terminals, and it was found that this acted as a very efficient protector, the charge flying across the short interval in the twist in preference to going through the coil. In order to make this system more mechanical and general, two wires of different colors were laid together and placed around the barrel of a small boxwood reel and applied to the ends of the coil. The wires themselves were still further protected by being drawn through melted paraffin. This last process has, however, unfortunately destroyed their efficiency, and experience has shown that these so-called protectors have become no protectors at all. Indeed, they only act at their own expense, for though they may save the coils from the first discharge, they are themselves destroyed. A succeeding discharge must infallibly destroy the apparatus. This is the method adopted up to very recently in the Needle and Morse instruments, but it has been partially abandoned for that in use in the alphabetical dial instruments, which is known as "S. A. Varley's carbon or 'lightning bridge' protector." The wires of the coil are attached to the termination of two insulated pieces of brass fitted in a boxwood cover, the opposed ends of which are pointed and inserted one-twentieth of an inch apart in a chamber filled with a mixture of carbon and non-conducting matter in a fine powder, the preparation of which remains a secret with the firm who conceived and supply the apparatus. The protector acts as a shunt,† which offers such a resistance compared with that of the coil, as to prevent any appreciable diminution in the strength of the working currents; but it is assumed that in the case of the discharges of atmospheric electricity the protential is so high as to overcome this resistance, and convert the bridge into a path for the discharge, in preference to the coil. They have sometimes caused inconvenience, owing to their particles becoming polarized, and forming a conducting line of low resistance, and thereby practically placing the instruments in short circuit. This is remedied by simply shaking, but it certainly is a defect of this form of apparatus.

Experience has shown that this carbon protector is not very efficient, and it is questionable how far it is based on correct principles. The chamber being filled with a partially conducting substance, prevents the peculiar action of the discharge through a gaseous medium which I have endeavored to explain above, and it being simply a shunt, it prevents the charge from being dissipated or passed to earth. I hold it essential for an efficient lightning protector to make use of the earth so as to form a path for the charge direct to earth, without simply leading it off to another place to possibly increase its destructive effect, as is done in these shunt protectors.

It will be seen that we in England protect our instruments. I think I am right in saying that in all other administrations the stations themselves are protected. It must be acknowledged that our system has proved a failure. It will be interesting to learn the experience of others. Until this year, the accidents in England have been trifling. In the Electric Telegraph Company, only 3 per cent. of their instruments suffered. This year is, in reality, our first year's experience in the Postal Telegraph Department—the previous years having been comparatively mild; and though so much severity can scarcely be expected to recur, it is well to be protected against its repetition.

The Postal Telegraph Department has greatly increased the number of instruments employed in this country. The number of stations have increased from 2932 to 5174, the number of instruments from 2175 to 8500. Its extensions have been erected into districts hitherto unoccupied by telegraphs. The area of the telegraphs exposed to the influences of atmospheric electricity has thus become greatly enlarged, and consequently the damage done has been greatly increased. In the days of the telegraph companies it was found unnecessary to protect their instrument, for the cost of applying any protective apparatus there would have far exceeded the damage done. Now, however, the matter has become more serious, and not only has the necessity of the employment of protective apparatus shown itself, but also the necessity of improving all such protective apparatus as have hitherto been adopted.

We have been more successful with our submarine cables, which are protected with another very ingenious form of lightning protector, also from the prolific house of "Varley." In this instrument an earth wire and the line wires are fused into a glass globe, which has been made a partial vacuum, and which, as is well known, offers a ready path for the discharge of electricity of high potential.

The discharge of electricity across air depends not only upon the distance which separates the opposite points, but upon the density of the air. The closer the air approaches a vacuum the less its resistance. Hence the efficiency of this "vacuum" protector.

They have frequently acted with great efficiency, and have given great satisfaction. ‡

In some of our cable nuts an additional security is obtained by inserting a spiral of fine platinum wire of 2 or 3 ft. in length between the line and the protector, and even this has been supplemented by the insertion of a form of protector in which a flat brass earth plate is separted from another plate in connection with the line, by a thin slip of paraffined paper. The latter has also proved itself to be a very efficient form of conductor, and, on examination, it is frequently found that the paper is pierced with small holes, giving the indication of carbonization, an evident proof of their having been effective in drawing charges from the wire, and passing them harmlessly to earth. The paper in itself offers an almost infinite resistance to the passage of the working currents, but the air in its interstices is easily overcome by the high potential of atmospheric discharges. It is thus impossible for the wire of the cable itself to be raised to so high a potential as to endanger the dielectric coating until all three protectors fail to act. There has not been a case of a cable so protected breaking down, while there are cases on record of unprotected cables being injured.

It must not, however, be forgotten that however valuable lightning conductors may be as protectors to our apparatus, they also produce numerous faults of their own. Thus, during the past year a large number of faults have been brought to my own knowledge, produced by the very few conductors under my charge. If their use becomes more general, the faults they produce must increase, so that in remedying one evil we generate another.

In India where the thunder storms are far more intense than in this country, and where scarcely a day elapses, during certain seasons, without the occurrence of lightning, very efficient means of protection have been adopted. Accidents are very rare. Every office is protected with simple earth plates, separated from line plates by a thin layer of air, the interval being maintained by thin ebonite washers. The line plate is sometimes studdied with points secured into it, and the line wire is connected to it through a small coil of platinum wire. The posts also, when not of iron, are for a mile on each side of an office protected with rods projecting above their tops. When iron posts are used, this protection is not needed.

The effects of atmospheric electricity in America are well illustrated by the following extract: "During a recent storm at Cincinnati, Ohio, the lightning followed the wires into the office, and at each flash concentrated in a sheet of flame on the switch board, producing a concussion similar, at first, to the discharge of a score of rockets, quickly followed by two reports as loud and distinct as the discharge of a six-pound cannon, succeeded in turn by a volley of musketry. It became necessary to disconnect all the wires, and keep them disconnected about an hour and a half. Some of the operators, who were unused to such severe electric displays, supposed at first that the 'day of reckoning' had come."

IV.—PREVENTION.

I have lastly to speak of the prevention of lightning discharge. I have shown that electric discharge is simply due to the fact of two points separated by air, being raised to such a difference of potential that the resistance of the air cannot restrain their neutralization across it. Now, if we prevent the increase of potential by dissipating the charge as it collects, we effect this object. This is the function of points. Points prevent the accumulation of charge. A pointed body, such as a needle, directed toward a charged conductor, dissipates the charge at once. A pointed conductor directed toward a charged cloud, dissipates the charge in its immediate neighborhood quietly and silently. If lightning is seen to play about the top of a conductor, it is a proof that it is out of order, and does not act properly. A glow or brush may be seen, but nothing more should be visible. Thus it is that the chief merit of a lightning conductor consists in the action of its pointed end, and hence the greater care should be taken to see that its point is maintained intact. Points are sometimes fused by powerful discharges. A properly constructed conductor may be said to prevent electric discharge within the sphere of its action. But it does not prevent thunder and lightning. When we consider the distance of the cloud and the area of its surface, the hight of a building vanishes in the general figure. Hence the discharge may occur very near, though not within its protected area.

Since the potential of the atmosphere increases as we ascend, and we place at the top, say of the spire of a cathedral, a pointed rod, we connect two points, the earth and the atmosphere, of different potentials by a conductor. The result must be a current. This current constantly flows in one direction. Its strength will vary with the potential of the atmosphere. The results must be at the point of juncture with the ground, electrolytic action, and destruction of the conductor. I went to Llandaff Cathedral to test this theory. The conductor is a small copper stranded wire fixed externally by iron spikes. I took hold of it with my hand, and it came out of the ground most readily. It was entirely corroded at about a foot below the surface. The strands of the copper wire were eaten away to fine needle points, in a way with which submarine cable engineers are fully acquainted. It was bright and clean, indicating clearly the passage of a current. Here is fresh source of danger; but it is mitigated, if not cured, by making earth with as large mass of metal as possible, such as the gas or water system of a town. The electrolytic action is thus spread over such a surface that its effect is infinitely small. Lightning conductors, however, of all kinds require periodical examination. They will not last forever. Their points should be maintained bright and clean, their electrical continuity should be kept perfect, their joint should be sound, and their earths should be good. If any of these points be neglected, the conductor fails to do its duty, and accident is the result. One of the brightest seeds of scientific thought is thus by ignorance and neglect allowed to fall into desuetude, and that which was erected for our protection may become a source of danger.

* From a paper read before the Society of Telegraph Engineers England, by W. H. Preece.

† Mr. Varley says: "Practically no electricity would pass from a fifty cell Daniell's battery through loose powdered black lead or wood charcoal; but a current of 200 or 300 cells would arrange the conducting particles by electric attraction and freely pass over; while a current of 600 cells would pass across a considerable interval of the ordinary dust met with in rooms, consisting chiefly of silica, alumina, and more or less carbonaceous and earthy matter."—*British Association.*

‡ At Talybont, on the Anglesey shore, on July 7th, 1872, one of the Manchester-Dublin wires were found to earth, owing to electric discharge having fused together the two points, line and earth, of a vacuum protector, and burst the glass globe. In detaching the wires from the box they came apart. The cable was undoubtedly saved.

The Universal Use of Arsenic.

Prof. Henry Wiertz writes as follows in the *American Gas Light Journal:*

We object not only to allowing Paris green to be spread over our fields, to contaminate the soil of our market gardens, but even to its being allowed, as it is, to be kept on open sale in our shops, so that an amount of poison which would sicken a city—by introduction into a distributing reservoir, for example—could at any time be purchased, without suspicion, by any maniacal or fiendish individual, and so introduced, with far less trouble or liability of detection than many of the murderous performances of such individuals often incur.

In America we are happily endowed by nature with a general absence of this deadly mineral arsenic from our rocks, our soils and our mineral waters, and we ought to keep ourselves so. Whether this is one cause or not of the known longer average of human life in America than in Europe, it will be safer and better for us to admit that it is one such cause, and not to thrown away or destroy our advantage in this respect by sprinkling arsenic over our vegetation all throughout the land. It is true the predatory insects must be destroyed, but let it be with such poisons—and they are known to be many—which have been given us by God for these special uses—which are endowed with deadly doom for all the insect tribe, while almost without hurt for man. Among such none are more prominent or more familiar than the gas tar products, of which we spoke in this same connection in our last issue. Let these be used instead of arsenic.

Arsenic is, in fact, getting to be, throughout the world, almost as common as dirt. We doubt very much whether it would not be impossible, at the present day, in any country, to convict, on chemical evidence, before any jury, the most bungling arsenical poisoner, if he or she had a legal defender who would make such use as he might of the argument furnished him by the almost universal distribution of the venemous element throughout our most familiar walks of life. We have received medicines, ourselves, from drug stores, wrapped in arsenical papers put up in Paris-green paper boxes, with arsenical paper caps tied over the corks, etc. We have often seen confectionery exposed for sale to young children wrapped in the deadly green paper. We have often found young children sucking toys painted with the horrible stuff, and with their mouths stained throughout with the venom. The Paris-green paper is one of the commonest in use for binding school books, and we have more than once taken such books away from our own young children, which had been given them by their teachers. Numerous deaths of children are well known to have been thus occasioned. No country can be called civilized in which such suicidal ignorance, such stupid slaughter of the innocent, is common. One more illustration only. It is very common to see a lawyer or his clerk, put into his mouth, to moisten the gummed side of it, a beautiful green paper disk, with scolloped edges, to attach to some document. These things are found in every lawyer's office in the land, and used constantly. They are seldom made of any other than the Paris green paper. Can this be ignorance, or are our lawyers all fatalists, and believe they can only "die when their time comes?" In commencing to write we had in our mind to refer to some of the wonderful facts developed of late, in Great Britain especially, of open carts loaded with white arsenic passing in open day through the country in some districts, with drivers sitting on the top of the hideous heap; such carts being often exposed all night openly to the rain; of strongly arsenical waters flowing from mines and metallurgical works into streams of water afterward drunk by large populations, and so on. These are facts. Everybody will remember the cargo of salt and arsenic together shipped to us from Europe a few months ago, which got a little mixed during a rough passage. This particular mixture was discovered in time, but have all such been discovered? The water we ourselves drink comes from a stream on one of whose tributaries is a large chemical works, which so contaminates the said tributary with arsenic that cattle drinking of it have been poisoned to death. These things, we say, are facts, on both sides of the Atlantic; but really, while we wrote the first part of this article—especially when we thought of the recklessness of the public press, which has actually recommended their rural readers, in many cases, to plie on the Paris green on their potato patches with a perfect looseness—these other things seem trifles, as flat and stale as they certainly are unprofitable; and our enthusiasm and zeal for the cause of humanity seems to wilt down into a sort of sentimentality, which is certainly ludicrously lame and impotent, if not downright sickly.

Captain Eads is making telling progress in his big dentistry experiment on the mouth of the Mississippi. He has now 400 men at work on the jetty, and has projected it foward the deep water over 3000 feet. Over most of the distance thus far built the water is about 8 feet in depth. The work is being pushed forward at the rate of nearly 200 feet a day, and he will soon have a larger force employed. He expects in a year to have a channel deep enough for the largest vessels.

New Nail Cutting Machine.

During the past week we have had an opportunity to inspect a new nail cutting machine which has many novel features, and which seems to promise great usefulness in the nail trade, by doing away with a large proportion of the hand labor now employed in it. The cutting part of the machine itself differs very little from the ordinary machine, except in the fact that heading is done at both sides of the machine. The improvement is chiefly in the feeding apparatus. The operation of cutting nails is as follows: After the machine is started the feed box is filled with hot plates, the machine immediately, without further attention, pushes out the under plate, which drops into its proper position, and is held by a pair of automatic nippers and fed into the machine, the nails being cut and headed alternately by the two sides of the machine. As soon as the plate is cut up the nippers return for another plate, dropping the stump into a proper receptacle on their way back. As they return another plate is thrown out of the bottom of the plate, or feed box, and is cut as before. If for any reason a plate is not thrown out of the feed box, the whole feed apparatus stops. If the plate does not feed into the cutters, the feed apparatus stops automatically. In fact, unless the machine is actually cutting nails the feed apparatus is at rest. Each motion is positive, so that the machine does not make slugs nor splints from imperfect feeding. The apparatus has an automatic adjustment for unequal widths of plates, so that in case it is desired, it will feed plates having three-eighths of an inch difference of width between the ends. "Winding" or crooked plates may also be fed. The only attention required during cutting is to keep the feed box full of plates. In stopping the feed and retiring for a plate, only six or seven cuts of the machine are lost, while by hand feed it is stated that some 20 or 25 cuts, all told, are lost in cutting up such plates. This, we think, however, depends upon the speed of the machine. The machine which we saw is capable of cutting 7¼ kegs of sixpenny nails in a day of nine hours, one hour per day being allowed for grinding. Taking out the cutters for grinding, the feed apparatus is removed simply by slacking up a couple of nuts at the front of the machine. The machine for sixpenny nails makes no less than 240 cuts per minute. The tenpenny machines, when fed by hand, cut about 10 kegs per day, while with the new machine the product would be about 15 kegs. One man can attend four machines, and on sixpenny nails can turn out about 30 kegs per day.

The inventor is Mr. F. A. Gleason, of Brooklyn. Mr. C. A. Ford, 24 Front street, New York, has the charge of the business department. We understand that these gentlemen propose to put up machines for trial, and to make arrangements with nail makers for fitting up factories.

Mechanical Stoker.

Firing aparatus, fuel feeders, or mechanical stokers, have been experimented upon for some time. A new one, recently tried with success upon a battery of marine boilers, presents some features of interest. It consists of a flat hopper placed above the fire door and before the boiler, and a mechanical device for grinding and injecting the coal. The hopper may be of any desired size. For stationary boilers, it might hold a ton or more; for marine boilers this would depend on the available room. The hopper ends below in an adjustable box, that may be enlarged or diminished in size as the nature of the fuel demands. In this box is a feed and crushing roller that breaks up the coal into dust or slack, and drops it below into a flat iron box holding two horizontal disks turning in opposite directions. The stream of slack or dust-coal falling between these opening disks is shot forward through and into the fire box.

By the use of this stoker, a fine shower of broken coal is continually spread over the entire surface of the grate bars, and, by governing the speed of the apparatus, the supply of fuel is regulated to suit the demand for steam. To prevent the fuel from caking into a mass of clinkers on the fire, every alternate grate bar is given an up-and-down and to-and-fro motion, that gradually breaks up the clinkers, and forces them forward upon a balanced plate that may be upset by the fireman, and the waste dropped into the ash pit. The top of each bar is notched so as to cause the clinkers to catch and travel in one direction. All parts of the apparatus are outside of the fire box, and there is no injury from heating and burning.

The valuable points claimed for this machine are freedom from cold currents over the fire, as there are no doors to be opened; freedom from smoke, as the combustion is more perfect; and the use of small, inferior and slack coal—with the same steam results. Another result claimed is the increased comfort of the fire room in point of temperature, as the fire-door is kept constantly closed. On one steamship where this stoker was tried, the saving in cost of fuel was marked. The first voyage with hand stoking lasted 53 days 13 hours under steam, with a consumption of 624 tons of coal, valued at £873. 12/. The second voyage lasted 52 days 11 hours, and the consumption of fuel by the use of the mechanical stoker was 619 tons of slack and 87 tons of coal, at a total expense of £578. 6/. The machine is being rapidly applied to a number of ocean steamers.—*Scribner's.*

The first water works in the United States were planned and constructed by John Christopher Christensen, at Bethlehem, Pa., in 1762. The machinery consisted of three single acting force pumps, 4 inch calibre and 18 inch stroke, and worked by a triple crank, and geared to the shaft of an undershot water-wheel, 18 feet in diameter and two feet clear in the buckets. The total head of water was two feet. On the water-wheel shaft was a wallower of 33 rounds, gearing into a spur wheel of 52 cogs, attached to the crank. The three piston rods were attached each to a frame or cross-head, working in grooves, to give them a parallel motion with the pump. The cross-head was of wood, as well as the parts containing the grooves as guides. The water was raised by this machinery to the hight of 70 feet, and subsequently to 114 feet. The works were in operation as late as 1832. The first rising main was made of gum wood, as far as it was subject to great pressure, and the rest was of pitch pine. In 1786 leaden pipes were substituted, and in 1813 they were changed for iron.

German Trade and Industry.

A Berlin correspondent of the London *Times*, speaking of the flush times which immediately followed the Franco-German war, proceeds to say:

Encouraged by this apparent prosperity, the socialistic movement for some time rife among the workingmen proceeded from theory to action, sending up wages, and, with wages, rent to twice and thrice its former figure. Provisions followed in due course. Thus, when the crash came and reaction set in at home, German manufacturers not only found the purchasing power of their own country greatly reduced, but, what was equally bad, the cost of production had been increased to such a degree as to render it difficult for them to compete in the markets of the world. As one mill after the other was forced to adopt short hours, wages, it is true, fell; but the price of provisions, being regulated by the needs of the European family at large, remained what it was, and accordingly prevented the price of labor from getting back to anything like the figure it started from in 1871. Neither could the former frugal and industrious habits of the hands be quickly revived, nor the conscientious solidity, once a characteristic of German workmanship, be restored immediately. Thanks to the combined influence of these various agencies, the commercial statistics of 1872 and 1873 assumed an unprecedented character, which struck terror into the national heart. In 1872, imports were estimated at 1,087,000,000 thalers, exports reaching only 773,000,000 thalers; in 1873 things looked still more gloomy, imports going up to 1,252,000,000 thalers, while exports went down to 767,000,000 thalers. When these returns of the commercial department became known, the ruin of German industry seemed to be at hand.

But in healthy bodies disease effects its own cure. The surplus money gradually finding its way into other lands, there remained nothing for the population of this country to do but to curtail expenditure and return to work in earnest. The Custom House statistics for 1874, though as yet incomplete, show this process of reform to be in full swing. * * * *

In conclusion, to give an idea of the comprehensive nature of the change through which Germany is passing, two facts may be cited. Residence in this capital has become such an expensive pleasure that the Russian Embassy draw higher saleries at Berlin than in London, notwithstanding that they pay no rent here, living in their Emperior's own mansion, and have comparatively few social duties to fulfill. This dearness extending from the highest to the lowest ranks, it is quite rational that manufacturers should find Berlin no abiding place for them. In other words, few masters being able to pay the wages the hands requre to live here, Berlin, a large manufacturing town but a few years ago, is getting less so every day. The iron works are either flitting to the country or preparing to do so; the great railway carriage manufactory—the greatest on the Continent—is winding up, the intractability of the workmen rendering even 10 per cent. of interest no sufficient attraction to continue business; and the immense manufacture of woolen goods is almost entirely transplanted to smaller towns and villages in Brandenburg and Silesia. It is the same in other large towns. This process being accompanied with the replacement by machinery of all manual labor that can possibly be spared, many of the men formerly employed in these trades are thrown out of work. For the moment they do not suffer, as the many military railway lines, fortresses and other army work going on in this country require almost all the hands that offer; but unless industrial revival steadily continues, they will feel the change when these temporary occupations are at an end.

How Inventions are Made.

The life of George Stephenson proves that, notwithstanding the novelty and great importance of his improvements in steam transit, he did not discover these improvements. He did not discover that a floating embankment would carry a railway across Chat Moss, neither did he discover that the friction between the wheels of a locomotive and the rails would enable a train to be drawn by tractive power alone. Everything connected with his history shows that all his improvements were founded on a method of reasoning from principles, and generally inductively; to say that he "discovered" our railway system, according to the ordinary construction of the term, would be to detract from his hard and well-earned reputation, and place him among a class of fortunate schemers who can claim no place in the history of legitimate engineering.

Count Rumford did not by chance develop the philosophy of forces upon which we may say the whole science of dynamics now rests; he set out, upon a methodical plan, to demonstrate conceptions that were already matured in his mind, and to verify principles which he had assumed by inductive reasoning.

The greater part of really great and substantial improvements which have performed any considerable part in developing modern mechanical engineering have come through this course of first dealing with primary principles, instead of groping about blindly after mechanical expedients; and present circumstances point to a time not for distant when chance discovery will quite disappear.—*Engineering.*

Good points in American furnace and rolling mill practice soon meet with recognition abroad. The issue of the *Moniteur Indst Belge* (published at Brussels, Belgium) for June 10, 1875, contains an extended notice of Weimer & Birkinbine's patent furnace charger, illustrated with very handsome cuts, which appeared in *The Iron Age* of March 18, 1875. This notice is, no doubt, highly gratifying to the enterprising members of this firm, but it is nevertheless fully deserved, as the device has been proven by actual use to be well adapted to its purpose. It is manufactured by the patentees at their works at Lebanon, Penn.

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WANTED.—A situation by a young man having had ten years' experience in the Hardware and Stove Business, either as clerk or salesman, or would travel. Hardware preferred.

Address, M. J., Office of *The Iron Age,* 10 Warren St., N. Y.

Merchant Iron or Nails

Wanted in exchange for 300 tons No. 1 Wrought Scrap Iron.

GILCHRIST & GRIFFITH,

Mount Pleasant, Iowa.

A. PURVES & SON,

Corner South & Penn Streets, Phila., Dealers in

Scrap Iron & Metals, Machinery, Tools, Shafting & Pulleys, Steam Engines, Pumps & Boilers, Copper, Brass, Tin, Babbit Metals, Foundry Facings. Best Quality Ingot Brass.

Cash paid for allkinds of **Metals** and **Tools.**

WANTED.—A first-class business man familiar with machinery and manufacturing, capable of handling large bodies of men, desires a responsible position. References satisfactory. Address,

IRON AND STEEL, Care of *P. O. Box 813, Bridgeport, Conn.*

DROP FORGINGS.

The TRENTON VISE & TOOL WORKS, Trenton, N. J., having increased their facilities, are now able to do all kinds of

Iron and Steel Drop Forgings

in quantities to order at reasonable rates.

HERMANN BOKER & CO., Proprietors, 101 & 103 Duane St., N. Y.

THE

McHaffie Direct Steel Castings Co.

STEEL CASTINGS,

Solid and Homogeneous, guaranteed to stand a Tensile Strain of 25 tons per square inch. An invaluable substitute for expensive **WROUGHT IRON FORGINGS** or for Iron Castings, where great strength is required. Office, cor. Evelina and Levant Sts., PHILADELPHIA.

Send for Circular and Price List.

Wanted.

A man for Superintendent of a Malleable Iron Works. Must have experience. Address

St. Louis Malleable Iron Co., St. Louis, Mo.

MANUFACTURERS

desirous of introducing their goods to the **British** and **Continental** Markets, are advised to insert advertisements in the newspaper **"IRON,"** published every Saturday, at *99 Cannon Street, London, E. C.*

SCALE: First 3 lines, 3/; every additional line, 10d. Price, 6d. per Copy, or 30/ per annum, inclusive of postage to the United States.

Special Notices.

$15,000 to $20,000.

A manufacturing firm with unusual facilities for producing goods in their line of manufacture, desires the above amount with a special partner. The firm is in healthy condition, made something less than 20 per cent. profit for the six months of 1875, notwithstanding a very depressed condition of prices, and want the money to carry stock only. First-class reference given. Address, *SPECIAL,* Office of *The Iron Age,* 10 Warren St., N. Y.

Important to Manufacturers.

BISSELL, WELLES & MILLET, Auctioneers and Commission Merchants, No. 15 Murray St., New York,

Solicit from Manufacturers and others consignments of Hardware and Cutlery for our weekly Auction Sales to the Trade, or at private sale for cash, as desired. Our facilities for moving large lines of goods are unsurpassed. Advances made if desired.

CHARLES GOOCH,

Commission Dealer in

Patented Articles and Hardware.

436 Market St., PHILADELPHIA.

Manufacturers who wish to make arrangements for the sale of desirable articles are invited to correspond.

TO INVENTORS AND MANUFACTURERS

The 44th Exhibition of the American Institute will open September 9th; Machinery will be received after August 15th, other goods after August 29th. For particulars address "General Superintendent, American Institute, New-York."

For Sale.

For Sale.

Car Shop in Conshohocken, Pa., 50x100 ft. fronting on P. and R. R. R., with blacksmith shop 20x30 ft., engine house 15x30, 25 horse engine, and all the modern machinery necessary. The lot is 135x300 ft. For particulars call on or address,

HUTCHINSON & FAGAN, Norristown, Pa.

INDIANAPOLIS.

The Best Retail Hardware Stand

in the State of Indiana For Sale, FOR 30 DAYS ONLY. $30,000 capital required. Sales now running from $400 to $600 per day. The very best reasons given for wanting to sell, which have no relation with the business. Such an opportunity for safe and profitable investment is rarely ever offered.

R. S. DORSEY, Broker, 8 Bates Block.

FOR SALE.

Rolling Mill and Bridge Building Machinery,

Of NEW ENGLAND IRON COMPANY.

Upright Corliss Engine, 32 in. cylinder, 5 ft. stroke; wheel, 32 tons, 25 ft. diam.

Puddling Train, Merchant Train, 16 in., built by Totten.

Rotary Squeezer, Etc., Etc.

Testing Machine.

Bolt Cutters.

Milling Machines, and all Machinery necessary for Bridge Work. In lots to suit. Apply to

WM. E. COFFIN & CO., 8 Oliver Street, Boston.

FOR SALE, HARDWARE BUSINESS.

Wishing to engage in other business, we offer our stock of Hardware For Sale on reasonable terms. Our stock comprises: Stoves, Tin ware, Shelf Hardware, &c., and has been selected with care and bought at low cash prices. To a person wishing to engage in business this offers inducements. Stock will invoice about $6000. For particulars, address,

BOX 5, Lima, N. Y.

DISCOUNT LISTS.

W. Butts and C. Butts, 13 discounts.....each 75c
Iron Screws & C. & P. Bolts 13 discounts... " 75c

DAYTON & LAMBERSON, 97 Chambers Street, N. Y.

For Sale.

A clean and complete stock of Hardware, Tin and Stoves, with the good will of an old and well established trade. Room centrally located and been used for same business for 25 years past, and in one of the most substantial and rapidly growing cities of Northern Ohio. Do a business of about $75,000 per year, and will invoice about $20,000. Will sell Hardware separate if desired. Good and satisfactory reasons given for selling. Apply to, or address,

MYERS & WILLIAMS, Tiffin, Ohio.

For Sale.

A prosperous and well known Hardware Manufacturing business in one of the most thriving towns in New England. A rare opportunity for moderate capital. None but those meaning business need apply. Address, P. O. Box A, Franklin Falls, N. H.

Charcoal Furnace for Sale

Near Cartersville, Ga. Complete, ready to run. With Brown Hematite Ores, greatest abundance. Also, two beds Manganese—lands in fee simple. Price, $12,000—offered at this figure only because it must be sold at once.

S. B. LOWE, Chattanooga, Tenn.

SPECIAL NOTICE.

I have three patents for Dies, Machinery, and Tools for making Augers and Bits, each running seventeen years; dated as follows: Dec. 19, 1865; January 31, 1866, and July 3, 1866. **There is a special claim on each of the Dies.** All persons infringing on said patents will be held responsible to the extent of the law. **Russell Jennings.**

DEEP RIVER, Conn., Sept. 7, 1874.

Charcoal Blast Furnaces.

Having during the past 10 years constructed and put in operation a number of the most successful Charcoal Blast Furnaces in the country, and having a competent corps of workman constantly in my employ, I am enabled to offer advantages in constructing or remodeling upon the latest and most approved plans.

Examinations of Furnace Property made and reported upon when solicited. Correspondence promptly attended to.

J. M. WHITE, Engineer, *22 W. Alexander St., Rochester, N. Y.*

For Sale, &c.

Iron Ore & Mineral Lands,

Thirty thousand acres, abounding in the several varieties of Hematite and Magnetic ores, covered with timber; limestone abundant; contiguous to one of the largest Railroads leading east and west, low freights insured; coal within 20 miles of Works. Consists of Charcoal Furnace and Forge of 200 tons a month capacity; fine manager's house, large store, stables and workmen's houses, &c. Labor 75c. a day; cost of Charcoal, 5c. a bushel; iron ore, $1·75 a ton; lime stone, 80c., all delivered at Furnace. Freight to Pittsburgh, $3·50, Baltimore, $2·40. Ores can be placed in Pittsburgh almost beyond competition. For sale, or will be operated jointly.

Address, *P. O. Box 863, Baltimore, Md.*

For Sale!

Hardware Business

In a growing manufacturing town, one of the best locations in Vermont. Business well established and profitable. Stock about $10,000, in good order. This affords an excellent opportunity for a party with small capital to secure a paying business.

Address, W. R. BIXBY & SON, Vergennes, Vt.

For Sale.

A first-class Hardware Business, located in the thriving city of Bloomington, Ills. Above business has been established for over twenty (20) years, and presents to any one desirous of doing an "A No. 1" retail and jobbing trade a most favorable opportunity. Amount of stock about $15,000. Will be sold at a sacrifice. Ample reasons given for selling. For further information, address,

GEO. BRADNER, Bloomington, Ills.

FOR SALE.

An ⅜ inch mill train for making Merchant, Band and Hop Iron. Will be sold cheap.

Apply to W. W. JONES, Near the Lehigh Valley Railroad Depot, Allentown, Pa.

FOUNDRY PROPERTY FOR SALE,

Or to lease with privilege to buy: consisting of Foundry, Machine Shop, with powerful steam engines, and other buildings. Water front on North River, Peekskill, 42 miles from New York, comprising 2¼ acres. Apply for particulars to

Box 332, P. O., Peekskill, N. Y.

To Stove Manufacturers and Foundrymen.

The Carbon Stove Company,

Of Burlington, N. J.,

Will sell their Foundry, with all its appurtenances, business and good will, upon very liberal and accommodating terms, offering to any party wishing to engage in the Stove or general Foundry Business a rare opportunity.

The Foundry Buildings, which are of a capacity to employ forty or more molders, are very conveniently located upon navigable tide water on one side, and the Pennsylvania Railroad, with its freight station in front, being on the direct line between New York and Philadelphia.

The Buildings, Machinery and Appliances are all in prime order, and the assortment of Patterns, &c., for Stove, Range or Heater work, unsurpassed.

Address, for terms or other particulars, *CARBON STOVE CO., Burlington, N. J.*

For Sale, Hardware Business

In successful operation since 1845. Rare opportunity to secure an old and established business. Stock of General Hardware, Iron, Nails, &c., &., will invoice $6000 to $8000. Two story brick business room, 25x90, with cellar under all, for $3000. After first payment will make such terms as will be easy, and cannot fail to suit purchaser. Will assist purchaser at starting, if necessary. Satisfactory reasons for selling will be given.

Address, C. U. RAYMOND, Cambridge City, Wayne Co., Ind.

A BLAST FURNACE FOR SALE at Napanoch, Ulster Co., State of New York, on the Delaware and Hudson Canal, with extra facilities, and a capacity of 20 tons per day Anthracite or 15 tons of Charcoal, together with a splendid water-power, goes with the furnace. The furnace is in good order and could be put in blast in a short time. Will be sold very low on accommodating terms. Charcoal can be had for many years.

Address, H. BANGE, *94 Gold Street, New York City.*

FOR SALE.

At Lowest Manufacturers' Rates,

GUNS & SHEET ZINC,

Best German and Belgian Brands,

By *LOUIS WINDMULLER & ROELKER, 20 Reade Street, N. Y.*

For Sale,

Stove and Tin Business.

Will sell, on good terms, one of the best arranged House Furnishing Stores in Canada West, at St. Thomas. The premises are roomy, the buildings having been arranged especially for this trade, with Tinsmith's workshops and benches complete for 12 men.

Present Stock about $6000.

St. Thomas is the head quarters of the Canadian Southern Railway Co. To a practical, energetic man this offers unusual advantages. Business well established and with good connection. Reason for disposal, present proprietors increasing their wholesale and retail Hardware Store next door to the above premises. Address

HORSMAN & HORSMAN, Iron and Hardware Merchants, St. Thomas, Canada West.



FOR SALE,

at 10c. a copy, general *Spanish Weekly Market Review,* written and published by the subscriber. 29 July, 1875, number 200, circulating in Mexico, the West Indies, Central and South America, including Brazil, Spain and Manila, on which certain standard articles of American manufacture are quoted. *Specimen Copies sent free.* The undersigned is also

Translator for Manufacturers and Land Companies,

from and into the

ENGLISH, SPANISH, FRENCH, and GERMAN.

Spanish Catalogues got up correctly and with despatch. Address, C. KIRCHHOFF,

Metal Reporter of "The Iron Age," Box 3091, N. Y.

Trade Report.

Office of THE IRON AGE,
WEDNESDAY EVENING, July 28, 1875.

The past week has been one of condsiderable excitement in all the financial markets of this country, and to some extent of Europe. The event of greatest general interest was the failure of the old and well known banking house of Duncan, Sherman & Co. This was wholly unexpected by the public, and under other circumstances might have precipitated a panic. Such, however, was not the case. No widespread distress is likely to result from the failure, and the temporary excitement has since abated. The liabilities of the firm are undoubtedly large, but they are so scattered that the losses will be spread over a wide area, and will fall most heavily upon those who will not be materially affected by it. It is understood that the obligations of the firm to Messrs. Baring Bros., and the Union Bank, of London, are fully secured by the indorsement of Mr. Alexander Duncan, father of Mr. Wm. B. Duncan, and a gentleman of great wealth. The failure was unquestionably due to bad management, and cannot be charged to the panic of 1873, nor, primarily, to the decline in cotton, in which the house had operated heavily. It is the opinion of many well informed gentlemen, with whom we have conversed, that the business of the house has been conducted honestly and with good intentions, but in a very loose and unsystematic manner for several years. Several of the most important departments of the business have been entrusted to gentlemen of conspicuous unfitness, without adequate supervision on the part of the responsible members of the firm. There has nothing appeared since the failure to show that the losses which have crippled the firm are of recent date. On the contrary, it is well known that they have been for several years nearing the point they have now reached, and that their heavy advances on cotton and railroad bonds was merely the culmination of successions of losses resulting from bad management. By improperly using their credit, which was good to the last, they might have averted the collapse, but they adopted the wiser and more honorable course, and the responsible members of the house are blamable only for the mismanagement which permitted their affairs to become so involved before they realized their position, and after it was too late to avert the final mistake of unwise railroad speculations and injudicious operations in cotton.

From present appearances it is safe to assume that the worst effects of the failure have already been experienced. Money is easy, indicating confidence, and call loans may be had at 2½ @ 3 per cent., and prime mercantile paper is quotable at 3½ @ 5 per cent. The suspension of the Commercial Warehouse Company to-day occasions no uneasiness outside of the Cuba sugar trade, and has no connection with the failure of Duncan, Sherman & Co.

The gold market has been weak, with the exception of a spasmodic advance of the premium to 116⅝ upon the announcement of the suspension of Duncan, Sherman & Co. The following table shows the daily range of the premium:

	Highest.	Lowest.
Thursday	113	112⅝
Friday	112⅝	111¾
Saturday	112¾	112
Monday	112⅝	112
Tuesday	116⅝	112¾
Wednesday	114¾	113⅞

In the stock market the cases above noted created a brief feeling, and stocks declined from ¼ to 9 per cent., followed by a prompt recovery. The highest and lowest of to-day's quotations of active shares are given below.

The bond market has been severely disturbed by the fluctuations of the gold premium, and prices of governments have fluctuated in sympathy therewith. Railroad bonds are strong on the strength of a good investment demand. We give below the closing quotations of governments.

The bank statement was again favorable, reflecting a further gain in legal tenders and specie, and a large curtailing of loans. The banks made a net gain of $1,448,900, and now hold in lawful money, in excess of the twenty-five per cent. required, $29,502,450, against $28,053,550 last week. The following are the camparative totals:

	July 17.	July 24.	Differences.
Loans	$279,558,800	$277,549,200	Dec. $2,009,600
Specie	16,964,900	17,519,400	Inc. 554,500
Leg. tend	72,795,300	75,015,200	Inc. 1,219,900
Deposits	250,826,600	252,128,600	Inc. 1,302,000
Circulation	18,801,600	18,599,400	Dec. 202,200

The following tables show the movements in foreign trade for the week:

IMPORTS.

	1873.	1874.	1875.
Total for week	$6,967,706	$8,740,546	$7,001,511
Prev. reported	233,178,266	230,434,477	193,099,251
Since Jan. 1	$240,145,972	$239,175,023	$200,100,762

Among the imports of general merchandise were articles valued as follows:

	Quant.	Value.
Anvils	90	$1,057
Brass goods	10	1,048
Bronzes	16	7,142
Chains and anchors	93	4,429
Copper		659
Cutlery	78	26,408
Guns	64	9,245
Hardware	26	2,505
Iron, pig, tons	246	4,728
Iron, sheet, tons	91	15,320
Iron, cotton ties	787	2,701
Iron, R. R. bars	2,825	52,241
Iron, other, tons	113	7,199
Lead, pigs	1,907	13,333
Metal goods	286	20,368
Nails	54	2,097
Needles	31	11,495
Old metal		49
Platina	1	3,649
Per. caps	16	3,785
Saddlery	3	708
Steel	767	11,404
Silverware	7	655
Tin, boxes	18,332	128,132
Tin, bbls	10	953
Tin, slabs, 631 lbs	67,700	12,946
Wire	269	6,411
Zinc	361,608	22,851

EXPORTS, EXCLUSIVE OF SPECIE.

	1873.	1874.	1875.
For the week	$5,764,923	$6,661,788	$5,793,286
Prev. reported	157,131,573	163,943,315	138,159,031
Since Jan. 1	$162,895,896	$170,605,103	$143,952,317

EXPORTS OF SPECIE.

Total for the week	$815,879
Previously reported	58,866,512
Total since January 1, 1875	$59,682,391
Same time in 1874	32,106,821
Same time in 1873	36,582,841
Same time in 1872	48,786,037

Government bonds at the close were quoted as follows:

	Bid.	Asked.
U. S. Currency 6's	122¾	123¼
U. S. 6s 1881, reg	119½	120
U. S. 6s, 1881, con	120½	121
U. S. 5-20 1862, con	115	—
U. S. 5-20 1864, reg	116¼	116¾
U. S. 5-20 1864, con	116½	117
U. S. 5-20 1865, reg	118¾	119
U. S. 5-20 1865, con	119½	120
U. S. 5-20 1865, reg. new	118¾	119
U. S. 5-20 1865, con	118¾	119
U. S. 5-20 1867, reg	119¾	120¼
U. S. 5-20 1867, con	120¼	120¾
U. S. 5-20 1868, reg	119¾	120¼
U. S. 5-20 1868, con	120¼	120¾
U. S. 10-40 reg	117	117¼
U. S. 10-40 con	117¼	117¾
U. S. 5s, 1881, reg	115	115¼
U. S. 5s, 1881, con	116¼	117

The following were the highest and lowest prices of stocks to-day:

	Bid.	Ask.
N. Y. Cen. & Hudson Consolidated	103⅝	103¾
Lake Shore	60⅞	58⅞
Rock Island	105	103½
New Jersey Central	109⅛	109
Michigan Central	64	63¾
Wabash	6¼	6¼
Western Union Telegraph	81½	78
Atlantic and Pacific Telegraph	20¾	20
Northwestern	40⅞	38½
" Pref	54	52¾
Milwaukee & St. Paul	36¾	34¾
" " Pref	59¾	58¾
Panama	125	125
Pacific Mail	38¾	36⅞
Erie	15¼	13¾
Ohio & Mississippi	22⅞	24¼
Union Pacific	73½	70½
Missouri Pacific	48¾	48½
Atlantic and Pacific Pref	14½	14½
C. C. and Ind. Central	4¼	4¾
Hannibal & St. Joseph	25	25
Quicksilver	15½	15⅝
do Preferred	21½	21⅝
Mariposa	11⅞	11

GENERAL HARDWARE.

Very few changes have occurred in the prices of Hardware during the week, and none of any importance. In the matter of Wood Screws nothing new has transpired, and it does not seem at all likely that anything will be made known of the proposed reduction before the expiration of the 30 days' notice given by the American Screw Co. In the meantime all large transactions are held in abeyance, and the only business we hear of is the filling of small orders for actual present wants. The Russell & Erwin Manufacturing Co. have taken the important step of adding to their business the manufacturing of Wood Screws, and to that end have entered into contracts for buildings and machinery. The new buildings will be erected on the company's property at New Britain, Conn., and adjoining their present factory. The manufacturers of the necessary machinery have given bonds for the fulfillment of their contracts not later than February 1st, 1876, at which time they expect to be in a position to turn out a complete assortment of Screws.

The failure of Duncan, Sherman & Co., particulars of which will be found in our money article, has not had any perceptible effect on the market, as far as Hardware is concerned, and the belief is expressed that the embarrassment which naturally follows such a disaster will not be felt outside of Wall street. Business continues to improve, both as regards actual transactions and the inquiry common to this season. A good many buyers from the West are in town, and the feeling prevails that the summer dullness is almost ended.

In Foreign Hardware there is little, if any, improvement in demand, and, with the exception of Ivory goods, no actual changes. The tone of the market is conspicuously firm, and we hear of no disposition on the part of importers to force sales or to accept orders at unremunerative figures. Charles Peace, No. 82 Chambers street, agent for Joseph Rodgers & Sons, Sheffield, informs us that, owing to the increasing scarcity of ivory, and the heavy advances in the London market for this commodity, they have been compelled to increase the advance on Ivory Table Cutlery to twenty-five per cent. instead of twenty per cent., as heretofore. There is also an advance reported in the price of Stag Coverings, but up to the present writing the value of the manufactured article has not appreciated.

In Nails we do not hear of any transactions of magnitude, and the tone of the market lacks strength. We quote 10d. at $3·25, net, for standard brands in large or small lots. As we said last week, there are in the market some outside lots of Nails which can be purchased at a reduction of 10 cents per keg from the price quoted above.

The Corrugated Metal Company, East Berlin, Conn., quote their "Champion" Ash Can and Sifters at the following list, which is subject to discount 30 per cent. For large orders an extra 10 per cent. is allowed:

THE CHAMPION ASH CAN (CORRUGATED THROUGHOUT).

Towner's Patent of June 23, 1874.

Sizes.	Made of Black Iron and Japanned.	Made of Galvanized Iron.	Made of Black Iron Galvan'd after being made. Is Water Tight.	Sifters with Covers.	Covers for Cans.
No. 1. 14 x 18	$2·25	$3·00	$3·50	$2·00	$0·35
No. 2. 16 x 20	3·00	4·00	4·50	2·50	·40
No. 3. 17½ x 22	4·00	5·00	5·50	3·00	·45
No. 4. 19 x 24	5·00	6·00	6·50	3·50	·50

We stated in a former issue the revised discount quoted by the Russell & Erwin Mfg. Co. for their Shovels, Tongs, Polished Fire Irons, &c. As their list for these goods is lower than the lists of some makers of similar goods, we publish it below:

Iron Head Shovel and Tongs.

No.	1	2	3	4	5	6
Per doz. pairs	$6·00	8·00	10·00	12·00	14·00	16·00

Iron Head Kitchen Shovels and Tongs.

No.	1	2
Per doz. pairs	$22·50	25·00

Brass Head Shovels and Tongs.

No.	1	2	3	4	5
Per pair	$1·90	2·13	2·55	3·00	3·36

Discount 50&10&2 for cash in 30 days.

The Wiebusch & Hilger Hardware Company, agents for Wm. P. Kellogg & Co., have issued the following list of new Curry Combs, which are worthy the attention of the trade. They are packed in paper board boxes, half-dozen in a box; full cases contain twelve to twenty-four dozen:

KELLOGG'S NEW WIRE-FRAMED CURRY COMB, WITH WIRE BRACES, ALL WROUGHT IRON.

Manufactured under Patent granted to William P. Kellogg, May 4, 1875.

Strong, durable and cheap. No wires running through the bars to catch the hair and dirt.

Price List.

		Per doz.
No. 500—6-Bar	Open Iron, Japanned	$1·30
No. 505—6 "	Close " "	1·50
No. 520—8 "	Open " "	1·85
No. 525—8 "	Close " "	2·00
No. 530—6 "	Open " Tinned	1·65
No. 550—8 "	" " "	2·00
No. 560—6 "	" Brass	2·10
No. 580—8 "	" "	2·50

The Reading Hardware Company have placed upon the market their Patent Improved Apple Parer for 1875. It possesses some novel features, which should commend it to the favorable notice of buyers. Fernald & Sise, No. 100 Chambers street, their agents in this city, quote these goods at $7·75 per dozen, net. An illustration of this machine will be found in advertisement on page 17. We print below their circular, which gives a very clear description of its operation:

'75 READING APPLE PARER.

We would call your especial attention to our Reading Patent Improved Apple Parer for 1875. The machine we have perfected and have now ready for the present season is, in its mechanical construction and arrangement, the most perfect and substantial ever made for the purpose. Among the many advantages we claim for this Parer, the following are deserving of notice:

1st. The great objection to all paring machines heretofore made is they leave part of the paring upon the base of the apple untouched. By our new arrangement an extra knife has been placed on the push-off lever, which completely removes all the paring left by the operation of the principal knife.

2d. The improved construction and arrangement of the parer is such that all the working parts project from the table to which it is attached, and no parings can interfere with its operation, but fall into a receptacle placed to receive them. All clogging, or the accumulation of parings around the machine is by this means avoided.

3d. By the regularity and uniformity of its movements, it is enabled to take off a much thinner paring.

4th. The effectual operation of the push off lever promptly removes the pared fruit without handling.

5th. Each machine by its compact structure occupies but a small space, and can be packed separately in a paper box, rendering it less liable to injury in transportation, and better adapted to the wants of the trade.

In conclusion we would distinctly state that to produce a perfect apple paring machine requires years of experiment and repeated improvements until you are enabled to overcome all imperfections. And we now offer to the trade the '75 Reading Patent Improved Apple Parer, (for 1875), manufactured only by the Reading Hardware Company, Reading, Penn. With perfect reliance in its operations and challenging competition, we recommend it to the merchant who would avoid the annoyance and loss of imperfect machines returned, and to the consumer, who, in purchasing, desires to receive full value for the amount invested, as the only Apple Paring Machine now in the market that will fulfill all the requirements; and with full confidence in its merits, we maintain that for perfection in mechanism, durability of construction, beauty of finish, and simplicity, regularity and effectuality of operation, it cannot be equaled, much less surpassed.

Soliciting your orders as early as possible, which will receive our prompt and careful attention.

Respectfully, yours.
READING HARDWARE COMPANY.
READING, Pa., July 1st, 1875.

Fernald & Sise have added to their line of specialties a new Transom Lifter, manufactured by J. F. Wollensak, Chicago, Ills. This Transom Lifter acts as a lock, and is exceedingly simple in construction, and easily applied; by its use the transom light can be opened at any desired angle and securely held in position. We have seen some handsome testimonials from hotel proprietors who have used the goods. They are finished in Bronze, Nickel Plated and Tinned, and are offered to the trade at the following list, net:

TRANSOM LIFTERS.

Price List, July, 1875.

Suitable For.	Diameter of Rod.	Length of Rod.	Price Each, Br'zd	Price Each, Tin'd.	Price Each, Nickel Plated.	For each additional foot in length add. Bronze.	Plated.	Nickel.
Hotels and Dwell'gs.	⅜ in.	3 Ft.	$1·25	$1·75	$2·35	0·15	0·20	0·20
	⅜ "	4 "	1·40	2·00	2·55	0·15	0·20	0·20
	5-16 "	3 "	1·50	2·00	2·75	0·20	0·25	0·25
	5-16 "	4 "	1·70	2·25	3·00	0·20	0·25	0·25
Offices	⅜ "	5 "	2·30	3·10	4·60	0·25	0·30	0·30
	⅜ "	6 "	2·55	3·40	4·90	0·25	0·30	0·30
Stores	⅜ "	6 "	3·20	4·50	6·60	0·30	0·35	0·35
	⅜ "	7 "	3·50	4·85	6·95	0·30	0·35	0·35

Lifters for Transoms Hinged on the Bottom, advance 15 per cent. on the above prices.

In ordering please observe the following rules:

1st—State how your Transom is hinged, whether on top, bottom, or center.

2d—Give distance from floor to bottom of Transom sash.

3d—Give about the size of sash; if the sash is recessed state how much.

The Russell & Erwin Mfg. Co. quote New England Sash Locks at the following list, less discount 20 per cent.:

No. 1,	Japanned	Per doz $3·25
No. 1½,	Bronzed Iron	" 3·00
No. 2,	Bronzed Metal	" 6·00
No. 3,	Nickel Plated	" 6·00

The Peck, Stow & Wilcox Co. have taken the agency for the goods of the Northampton Hardware Co., manufacturers of House Furnishing Hardware, Chopping Knives, Screw Drivers, and similar goods. Their list for these specialties is not yet issued. William A. Dodge, No. 96 Chambers street, has been appointed agent in this city for the Eagle Square Co.'s Steel and Iron Squares, and will carry a full stock of these goods. The Kimball Shovel Co., of Baltimore, Md., illustrate in their advertisement on page 33 "Kimball's Patent Solid Cast Steel Shovels." They claim for these goods that they are the strongest Shovels ever offered to the trade, and are specially adapted for railroad, turnpike and mining purposes.

We print below the revised list of Locks, Latches and Knobs manufactured by the Norwich Lock Mfg. Co. It will be observed that a great many new goods have been added since the publication of their 1874 catalogue. Quackenbush, Townsend & Co., No 59 Reade street, are their agents.

REVISED LIST NORWICH LOCK MFG. CO.

MORTISE LOCKS AND LATCHES.

No.	Per doz.	No.	Per doz.	No.	Per doz.
0	$ 2·00	131	70·00	‡215	22·50
2	2·25	140	10·00	‡220	30·00
5	2·50	155	5·50	‡225	30·00
6	3·75	155¼, New	5·50	‡235	27·00
10	4·50	156	10·50	‡237	21·00
11	5·75	‡156½, New	10·50		Per set.
15	4·00	‡157½, New	12·50	240, New	19·50
16	5·25	158¼, New	7·00		Per doz.
20	3·75	159	22·00	252	44·00
25	5·75	‡160	19·00	252½	30·00
26	7·00	165	6·00	253	46·00
27	7·00	165¼, New	6·00	253½	32·00
30	9·50	165½, New	6·50	255	48·00
35	8·25	166	7·50	255½	34·00
40	16·00	166¼, New	7·50	256	52·00
50	18·50	‡166½, New	8·00	256½	38·00
55	12·50	‡167	10·00	257	56·00
‡60	25·00	‡167½, New	10·00	260	48·00
65	16·00	‡168	11·00	260½	34·00
‡66	20·00	‡169	13·00	261	52·00
75	4·00	175	7·00	261½	38·00
80	8·25	‡176	9·00	‡262	56·00
90	7·75	‡177	11·00	‡265	65·00
91	8·75	‡178	12·00	‡266	59·00
95	11·50	‡179	14·00	‡266½	46·00
96	12·50	‡180	17·00	‡267	53·00
97	11·50	‡181	20·00	‡267½	42·00
98	12·50	184	22·00	270	84·00
105	5·75	‡185	13·00	270½	50·00
110	4·50	‡186	15·00	271	96·00
‡111	5·75	‡186½	27·00	271½	66·00
‡112	7·00	‡187	18·00	272	64·00
115	7·50	‡187½	30·00	272½	48·00
‡116	8·75	‡188	21·00	273	68·00
‡117	14·75	‡188½	33·00	274	64·00
120	23·00	‡190	10·00	274½	48·00
121	29·00	‡191	12·00	275	68·00
‡121½	31·00	‡195	12·50	*280	99·00
122	32·00	‡196	14·50	280½	62·00
‡122½	34·00	‡197	17·50	281	111·00
123	35·00	‡198	20·50	281½	72·00
‡123½	37·00	200	24·00	285	62·00
124	44·00	203	35·00	290	25·00
‡124½	46·00	205	9·50	291	27·00
125	51·00	206	11·50	295	29·00
126	60·00	210	5·75	296	35·00
130	61·00	211	7·00	300	50·00

Front Door Locks and Latches.

No.	Per set.	No.	Per set.	No.	Per set.
252	$6·17	261½	$7·50	272	$9·33
252½	6·17	262	7·83	272½, New	9·33
253	6·50	261½	7·83	273	9·67
253½	6·50	263	9·25	272½, New	9·67
255	6·83	263½	9·25	274	9·33
255½	6·83	266	8·75	274½, New	9·33
256	7·50	266½	8·75	275	9·67
256½	7·50	267	7·92	275½, New	9·67
257	7·83	267½	7·92	280	13·42
257½	7·83	270	11·17	280½	13·42
260	6·88	270½	11·75	281	15·25
260½	6·83	271	13·00	281½	15·25
261	7·50	271½	13·00		

Rim Locks and Latches.

No.	Per doz.	No.	Per doz.	No.	Per doz.
320	$ 3·75	463	30·00	‡579	23·25
325	4·00	464	38·00	580	8·75
326	5·25	†470	23·00	590	28·00
330	5·00	*471	28·00	591	39·00
331	6·25	*472	31·00	592	45·00
335	3·75	*473	34·00	†595	32·00
340	5·00	*474	42·00	†596	43·00
345	10·00	480	22·00	*597	49·00
346, New	10·00	481	31·00	610	13·50
350	22·50	482	39·00	611	15·50
351, New	16·00	†485	24·00	612	18·50
352, New	18·00	*486	35·00	613	23·50
354, New	21·25	*487	43·00	614	26·50
355	36·00	500	12·00	†617	26·50
360	4·25	501	12·50	†618	29·50
361	5·50	502	18·50	620	15·00
365	4·25	505	14·00	621	17·00
370	4·75	506	14·50	622	21·25
381	9·50	507	20·50	623	25·00
390	8·00	510	13·50	624	29·25
391	12·00	511	18·00	†627	28·00
393	10·00	512	17·00	†628	32·25
394	14·00	513	21·00	635	38·00
405	3·75	515	15·50	636	44·00
406	5·00	516	20·00	637	50·00
407	6·25	517	21·00	638	58·00
410	4·50	518	24·00	*640	48·00
411	5·75	535	5·00	*641	56·00
412	7·75	540	5·25	*642	62·00
414	11·00	540½, New	5·25	655, New	5·75
415	5·00	541	6·75	656, New	7·25
416	6·50	541½, New	6·75	657, New	9·25
417	12·50	543	5·25	660, New	7·00
419	14·50	545	5·50	661, New	8·50
420	6·50	545½, New	5·50	662, New	11·75
421	8·00	546	7·00	665	8·50
422	14·00	546½, New	7·00	666	10·50
423	16·00	547	5·75	667	12·50
430	8·50	547½, New	5·75	670	10·00
431	10·00	548	7·25	671	12·00
432	16·00	548½, New	7·25	672	15·50
433	18·00	550	5·50	675	10·50
*435	24·00	555	6·00	676	12·50
*436	30·00	560	6·00	677	14·50
*437	38·00	561	7·50	678	20·50
440	18·00	562	9·50	680	12·00
441	21·00	565	7·50	681	14·00
442	24·00	566	9·00	682	17·50
443	24·00	567	12·25	690	40·00
444	27·00	570	9·00	691	46·00
*450	22·00	571	10·50	692	62·00
*451	25·00	572	12·50	*695	44·00
*452	28·00	‡573	18·50	*696	50·00
*453	28·00	‡574	20·50	*697	66·00
*454	31·00	575	10·50	985	4·00
460	21·00	576	12·00	990	5·00
461	24·00	577	15·25		
462	27·00	‡578	20·00		

DOOR KNOBS.

Mineral and Porcelain Knobs.

No.	Per doz.	No.	Per doz.	No.	Per doz.
1000	$2·25	1022	$6·50	1047	$12·00
1001	4·50	1023, New	3·00	1050	9·00
1002	4·50	1028, New	3·00	1051	12·00
1003, New	2·25	1030	3·00	1052	12·00
1010	2·25	1031	6·50	1055	9·00
1011	4·50	1032	6·50	1056	12·00
1012	4·50	1035	3·00	1057	12·00
1015	2·25	1036	6·50	1060	9·00
1016	4·50	1037	6·50	1061	12·00
1017	4·50	1040	6·75	1062	12·00
1018, New	2·25	1041	6·75	1063	7·25
1020	3·00	1045	9·00	1064	7·25
1021	6·50	1046	12·00		

Swivel Spindles, $6·00 extra.

Glass Knobs.

No.	Per doz.	No.	Per doz.	No.	Per doz.
1100	$10·50	1120	$20·25	1140	$21·00
1101	13·25	1121	21·75	1141	21·00
1105	19·25	1130	12·25	1145	31·50
1106	21·00	1131	15·75	1146	31·50
1115	11·25	1135	21·75	1147, New	21·00
1116	14·00	1136	22·25	1148, New	21·00

† With Plated Escutcheons.
‡ With Nickel Plated Keys.
* These Locks are listed with Nickel Plated Keys, but will be put up with Keys *not* Nickel Plated, if desired, at $2 less per dozen.
† These Locks are listed with Nickel Plated Keys, but will be put up with Keys *not* Nickel Plated, if desired, at $1 less per dozen.
‡ With Nickel Plated Keys.

Plated Knobs.

No.	Per doz.	No.	Per doz.	No.	Per doz.
1150	$48·00	1155	$30·00	1160	$60·00
1151	48·00	1156	30·00	1161	60·00
1152	51·00	1157	32·50	1162	63·00
1153	51·00	1158	32·50	1163	63·00

Closet Knobs.

No.	Per doz.	No.	Per doz.	No.	Per doz.
1200	$2·25	1206	$3·00	1211	$9·00
1201	2·25	1207	3·00	1212	6·75
1202	2·25	1209	9·00	1213	6·75
1205	3·00	1210	9·00	1214	7·25

Refrigerator Knobs.

No.	Per doz.	No.	Per doz.
1215, New	$2·00	1217, New	$6·00
1216, New	2·50		

Canada Bolt Knobs.

No.	Per doz.	No.	Per doz.
1220	$1·00	1222	$2·75
1221	1·50		

Mortise Bolt Knobs.

No.	Per doz.	No.	Per doz.
1225	$2·00	1227	$6·00
1226	2·50	1228	6·00

Store Door Crank Handle Knobs.

No.	Per doz.	No.	Per doz.
1230	$7·00	1232	$24·00
1231	10·00		

T and Crank Handle Knobs.

No.	Per doz.	No.	Per doz.
1245	$6·00	1247	$20·00
1246	7·50	1248	15·00

Straight T Handles.

No.	Per doz.	No.	Per doz.
1260	$3·00	1261	$15·00

Turnbuckle Knobs.

No.	Per doz.	No.	Per doz.
1265	$3·00	1267	$7·50
1266	4·00		

Turn Knobs and Plates.

No.	Per doz.	No.	Per doz.
1270	$1·50	1272	$2·50
1271	2·00	1273	3·50

Hall's Patent Lava and Argillo Knobs.

	Brown Lava.	Light Lava.	Black Lava.	Argillo Iron Rose.	Argillo Plated Rose.
Nos	1	2	3	4	5
List per doz.	$17·25	$17·25	$17·25	$9·50	$17·25

Escutcheons to match, $3·00 list per dozen.

We invite attention to the advertisement of the New York Mallet and Handle Works on page 17.

BRITISH IRON MARKET.

(*Specially reported by cable for The Iron Age.*)

WEDNESDAY, July 28, 1875.

Scotch Pig.—The market is quiet, with fair business doing. Prices are weak. The following are makers' quotations:

Coltness No. 1	69/
Gartsherrie No. 1	68/6
Glengarnock No. 1	66/6
Eglinton No. 1	61/

Manufactured Iron.—There is little doing, with small demand and weaker prices.

Rails are unchanged.

IRON.

American Pig.—The same old stereotyped expression, "nothing new," has to be repeated again this week, and, as noted before, without prospects of any early improvement in the general position. The demand is still limited to the few lots wanted for urgent orders, and buyers cannot be induced to operate beyond, even when tempting inducements are offered. Some of the weaker companies and second hands are offering liberal terms to purchasers, but the larger Lehigh makers are still inclined to be steady in their views. The production is still on a moderate scale, but unless there are indications of an improvement, it is probable further reduction will be necessary. The stock on hand is ample for the wants of the trade for some time to come. We continue old quotations, but they must be considered as more or less nominal. We quote: No. 1 Foundry, $26 @ $28; No. 2 Foundry, $25 @ $26; Gray Forge, $23 @ $25; White and Mottled, $21 @ $22.

Scotch Pig.—The market for Scotch Iron continues dull and devoid of interest. A few consumers who prefer this class of Iron are taking small parcels, for which they are compelled to pay full prices, and these about comprise all the transactions going on. Little, if any, demand for large lots exist. The stock here and on the way is rather moderate, and importers are not encouraging shipments hence. Sales, in small lots, foot about 250 tons, generally at $30 @ $31, for Eglinton. We quote nominally, Coltness, $31·50 @ $32; Glengarnock, $32·50 @ $33; Gartsherrie, $31·50 @ $33; Eglinton, $30 @ $31.

Bar.—Only a moderate demand prevails for Manufactured Iron, and prices nominally remain unchanged. We quote Refined Bar at 2·6c. @ 2·8c., at the mill.

Rails.—Quite a fair inquiry is reported for new Rails, and negotiating is going on, although but few actual sales have been closed. The supply of English in bond is not very large. Some domestic of old manufacture is said to be obtainable at a slight concession from ruling values, but all recent production is steadily held. Steel Rails are without reported movement, though prices steadily maintained. We quote at $47 @ $50, at the mills, for American, currency, and $48 @ $50, gold, for Welsh.

Old Rails.—Little, if anything, has transpired in regard to Old Rails. The offerings are not large; still, a fair quantity could be obtained at about current rates. We quote nominally at $26 @ $26·50.

Scrap.—The demand for Scrap is rather moderate, but with the light supply, holders are disposed to be pretty strong in their asking prices. We quote at about $31 @ $32 for No. 1.

METALS.

Copper.—There have been taken by consumers during the week between 300,000 and 400,000 pounds of Lake Copper, on the spot, at 23c., at which the market closes strong. Fu-

tures are neither inquired for nor offered, and we call them, nominally, 23½c. Baltimore Copper is quiet and firm at 23c. A good many people in commercial circles, upon the announcement of the suspension of one of the more prominent banking houses in our midst, seemed to be apprehensive of a bad effect on general business by reason thereof. There is evidently no cause for any similar fears; if a few individual firms, notwithstanding the warnings of the panic, have indulged in hazardous dealings on a large scale, the general business community has, on the contrary, shunned overtrading, thus placing trade and industry on a sound basis. The present situation being essentially different from what it was in September, 1873, confidence in the future remains unshaken. And this relates more especially to the metal trade, which in this country, at least, may be put down as being one of the most conservative branches of commerce, not much given to assuming unusual risks as long as they can be avoided. Telegrams from London repeat the quotation of £80 for Chili Bars. The decline suffered by the metal since July 1st has, to some extent, been brought about by the London failures, and, finally, by larger Chilean charters than had been anticipated, being 4000 tons for the latter half of June. According to the Belgian Consul's (at Valparaiso) statistics, the Copper export for 1874 was 48,253 tons, against 42,177 in 1873, an excess of 6076 tons. Mail accounts are to hand from London up to the 17th inst., bringing us the English Board of Trade returns, which show a gross amount of imports for the six months of 42,287 tons, against 37,868 and 34,595 in 1874 and 1873, while there were exported of Copper in the manufactured state 24,578 tons, against 20,218 and 28,240. The manufactures of Copper are sustained at the following quotations: New Copper Sheathing, 30c.; Bolts and Braziers, 31c.; Bronze and Yellow Metal Sheathing, 22c.; and Bolts, 28c.

Tin.—A cablegram was received from London this morning quoting Tin dull at £77. 10/, and adding, "Holders pressing sales," while under date of 26th inst. Singapore wired $21. The tendency, therefore, still appears to be downward, and will probably be reflected at the Dutch Trading Company's sale to-day, the result of which will very likely transpire to-morrow. Mail advices from London of July 17, already quoted, Sept. delivery, Straits as low as £77· 10/, forshadowing a further break in spot Tin since taken place; the actual decline in spot Tin then already amounted to £10 for the past three months. Our own market has remained quiescent at the following gold quotations for large lots: Straits, 18⅛c.; English Refined, 18¾c.; ditto Common, 18½c.; and Banca, nominally, 23c. The first shipments of Tasmanian (Australia) Tin had arrived at London, and all that would reach that city during the current year would in all likelihood not exceed 300 tons. Much praise is bestowed on the quality, which, when assayed, proved to be 99·96 per cent. of pure Tin. It was further free from even a trace of wolfram, so injurious to Tin; it was judged superior to Australian from the main land, and fully as good as Straits. Tin Plates have remained comparatively quiet as follows, gold, per box, in large lots, ordinary brands: Charcoal Bright, $8·00 @ $8·25; ditto. Terne, $7·25 @ $7·50; Coke Tin, $6·75 @ $7·00; and ditto. Terne, $6·50 @ $6·75, all gold.

Lead has remained quite inactive, sales not exceeding 100 tons for the week, at 5·95c. @ 6c., gold, for Domestic. At St. Louis the quotation is 6½c., currency, which is equal to 7·15c. @ 7·25c., currency, here. Foreign Lead has to be written nominal, at 6¾c. to 6¾c., gold. According to the London accounts Lead was in better request on the 17th instant, and sales both of English and Spanish Soft Pig had been effected on slightly better terms, English bringing £22 @ £22. 5/, and Spanish £21. 10/, Marseilles remaining under the influence of a lack of orders. The manufactures of Lead are sustained here. We quote Bar, 8¼c.; Pipe, 9¼c.; and Sheet, 9½c., less 10 per cent.

Spelter and Zinc.—Domestic Spelter does not yet come up to the expectations that had been formed of it when the combination party put up the price to 7·35c. @ 7·50c., currency, cash and time. There has been some underselling going on, it would seem, by people who had contracted ere the price was raised, and who take 7¼c., currency. Of Foreign no sales are reported, either on the spot, or to arrive, and the same has to be called nominally at 7½c. @ 7¾c., gold. The German markets, according to the advices to hand this day, were quiet but firm, without change in rates. At London on the 17th instant the metal was not as firm as it had been previously, the demand having slackened considerably. Sheet Zinc remains dull at 8¾c. @ 9c., gold, as to size.

Antimony.—London is steady. Stocks here have now dwindled down to comparatively little, and the market remains firm, though but moderately active, at 13½c., gold.

OLD METALS, PAPER STOCK, &c.

We have very little change to note in the condition of this market since our last report. Business continues dull, and prices remain about the same as last quoted. There is little demand from consumers for any description of stocks, with the exception of Tarred Shaking, which is in good request. We quote the following as the current purchasing rates:

Old Metals.—Copper, 16c. @ 17c. per lb.; Yellow Metal, 11c.; Brass, 10c. @ 12c.; Composition, heavy, 13c. @ 14c.; Lead, solid, 5½c.; Tea Lead, 4½c.; Zinc, 4½c. @ 4½c.; Pewter, No, 1, 18c.; do., No. 2, 8c. @ 12c.; Spelter, 5c. @ 5½c., Wrought Iron, 1c.; Sheet do., ½c.; Cast, do., ½c.; Machinery, do., ¾c.

Rags, &c.—Canvas, Linen, 4½c. @ 5¼c.; do. Cotton, No 1, 5¾c. @ 6¼c.; No. 2, 2¼c.; White, No. 1, 6¼c.; No. 2, 4c.; Colored, do., 2c. @ 2½c.; Mixed, Woolen, 2c. @ 3c.; Soft, do., 5c. @ 5½c.; Gunny Bagging, 1¼c.; Jute Butts, 1¾c. @ 2c.; Kentucky Bagging, 3c.; Book Stock, 3c.; Waste Pape and Scraps, 1½c.; Kentucky Bale Rope, 4c.; Oakum Junk, No. 1, 4½ @ 5c.; do. No. 2, 3c.; Tarred Shaking, 1c. @ 1¼c.; Grass Rope, 2¾c. @ 3c.

IMPORTATIONS.

Of Hardware, Iron, Steel and Metals into the Port of New York, for the week ending July 27, 1875:

Hardware.

Bainbridge H. & Co.
Tierces, 1
Boker Hermann & Co.
Mdse. pkgs., 5
Casks. 23
Cases, 9
Arms, cs., 9
Blumenthal I. & A.
Cases, 3
Booth R. W. & Co.
Chains, cks., 20
Casks, 1
Dow, Hunt & Co.
Cases, 1
Dreyfus Bros. & Weiller,
Cases, 1
Fisher J. L.
Tools and saws, cs., 4
Fuller Bros.
Chains, cks., 6
Files, cas., 2
Edge tools, cks., 2
Curry combs, cks., 1
Hardware, pkgs., 4
Field A. & Co.
Casks, 20
Anvils, 12
Cases, 16
Hecht Bros.
Boxes, 1
Hutchinson J. W.
Guns, cs., 3
Hayden & Tompkins,
Casks, 1
Jackson R. D.
Cases, 28
Kober Geo. & Sons,
Cases, 21
Keary P. J. & Bro.
Cases, 18
Lau & Gartichs.
Mdse. pkgs., 1
Laughland & Co.
Netting, cks., 2
Wire, pkgs., 8
McCullough & Co.
Cases, 14
Merchants' Dispatch Co.
Guns, cs., 1
Casks, 2
Mason John W. & Co.
Wire rope, coils, 26
Noyes, White & Co.
Per. caps, cs., 4
Poppenheimer L. & Co.
Casks, 3
Robbins C. & Sons,
Cutlery, cs., 1
Wire rods, bdls., 56
Strasburger, Pfeiffer & Co.
Cases, 5
Sawyer John,
Wire rope, coils, 3
Schener Bros.
Cases, 3
Sanderson Geo. & Co.
Grindstones, 50
Thompson, Langdon & Co.
Cases, 4
Thornton J. & Co.
Cases, 3
Turnor R. A.
Guns, cs., 6
Cases, 4
Casks, 1
Van Wart & McCoy,
Cases, 2
Mdse. pkgs., 3
Wood & Leggatt,
Cases, 1
Tools, cs., 1
Plow plates, 400; bdls., 4
Witte G. & Bros.
Arms, cs., 6
Wiebusch & Hilger Mfg. Co.
Cases, 22
Casks, 9
Cutlery, cks., 9
Wolffe S. N. & Co.
Cases, 6
Wetzler M.
Cases, 41
Young, Smith & Co.
Cases, 23
Order.
Tools, cs., 1

Iron.

Bolitho Thos. & Son,
Sheet, pkgs., 980
Douglass Jas. & Co.
Scrap, tons, 2
Fleitmann & Co.
Plates, 100
Henry & Harker.
Pig, tons, 50
Lang W. Bailey & Co.
Bars, 986
Bundles, 40
Laughland & Co
Hay bands, bdls., 760
Lennox E. S. & Co.
Bale ties, lots, 240
Moore D. & Co.
Galvanized, cs., 10
Marvel Wm. D.
Ore, tons, 376
Naylor & Co.
Bars, 11,801
Rod, coils, 478
Rails, 1988
Phelps, Dodge & Co.
Sheet, bdls., 316
Williston, Knight & Co.
Boxes, 100
Order.
Coils, 429
Pig, tons, 200
Spiegel, lots, 1

Steel.

Brown Wm.
Bundles, 101
Lang W. Bailey & Co.
Bales, 220
Clark & Co.
Steel shutters, cs., 1
Hugill Chas.
Cases, 4
Casks, 2
Bundles, 122
Naylor & Co.
Cases, in bars, 5
Cast, bars, 1
Tires, cast. 24
Points, cast, 1
Axles, cast, 50
Cases, 5
Jacobs, Strouse & Co.
Sheets, cks., 6
Steel strips, cks., 4
Casks, 6
Sulzbacher & Co.
Packages, 44
West, Bradley & Cary,
Wire rods, bdls, 75
Woodford W. O.
Cases, 58
Order.
Bundles, 252
Bars, 24

Metals.

Byrne Joseph & Co.
Tin plates, bxs., 1235
Bruce & Cook,
Tin plates, bxs., 267
Cort N. L. & Co.
Tin plates, bxs., 910
Dickerson, Van Dusen & Co.
Tin plates, bxs., 400
Phelps, Dodge & Co.
Sheet zinc, cks., 180
Tin plates, bxs., 1663
Black taggers, bxs., 62
Order.
Tin and terne plates, bxs., 3622
Sheet, zinc, cks., 20
Lead, pigs, 1207
Lead, bars, 2

COAL.

The Anthracite Coal trade continues fairly active. For Lump, Steamer and Broken Coal, the demand is not likely to equal the supply until the various iron works are more generally in operation. It is reported that several of these works in the Schuylkill region will resume in the coming month of August. Retailers are very busy, as the lateness of the season has caused an accumulation of work, and some time must elapse before they can get through the pressure of business which seems more likely to increase than diminish. Dealers who have the ability and room to stock Coal, are now buying more freely, feeling satisfied that if they do not purchase at once they will have to pay a higher price hereafter. This has been induced by the advance agreed upon for the month of August by the committee of operators who adjust prices monthly.

The following are the cargo prices of the different companies' Coal, delivered at the various shipping ports near New York during the month of August:

	Lump.	Steamer.	Grate.	Egg.	Stove.	Chestnut.
FROM WYOMING REGION.	$	$	$	$	$	$
Lackawanna D. & H.	5 00	5 10	5 20	5 45	5 90	4 90
Wilkesbarre	5 00	5 10	5 20	5 45	5 90	4 90
Plymouth Red Ash, net	.....	.....	5 20	5 45	5 90	4 90
Pittston, open market	5 10	5 10	5 20	5 40	5 85	4 85
Scranton	5 00	5 10	5 20	5 45	5 90	4 90
FROM LEHIGH REGION.						
Old Company's Summit	5 55	....	5 45	5 55	5 90	5 10
N. Y. Lehigh Coal Ex.	5 55	....	5 45	5 45	5 90	5 10
Honey Brook Lehigh	5 55	....	5 45	5 55	5 90	5 10

Freights from the above shipping ports to New York City are as follows, including the unloading:

Hoboken	40	Rondout	50
Weehawken	40	Elizabethport	40
Port Johnston	40	South Amboy	45

The quantity of Coal sent from the Schuylkill region the last week was by rail 124,505 tons; canal, 30,131 tons; for the week, 154,636 tons, against 1610 for the corresponding week last year. Increase, 153,026 tons.

The supply sent from all the regions for the week was, Anthracite, 598,361 tons; Bituminous, 80,284; for the week, 678,645 tons, against 354,276 tons for the corresponding week last year. Increase, 324,369 tons.

The supply sent from all the regions so far this year foots up 9,915,476 tons, against 13,121,787 tons to same period last year. Decrease, 4,206,311 tons. The decrease in Anthracite is 3,303,672 tons.

We quote as follows: Anthracite, $4·90 @ $5·90; Cumberland, $6·50 @ $7; West Virginia, $6·75 @ $7; James River Steam, $6·25; James River Carbonite, $9 @ $9·50; Kanawha House, £11·50; American Gas, $6·75 @ $7·25; American Cannel, $12 @ $14; Pennsylvania and Westmoreland, $6·75; Murphy Run, $6 50; Newburg Orrel, $6·50; Sterling Ohio, $10; Ince Hall, $17 @ $18; Liverpool House Cannel, $17; Liverpool Gas, $12; Newcastle Gas, $7 Scotch, $7·50 @ $8.

The Coal transported over the Cumberland Branch Railroad during the week ending July 24, 1875, amounted to 4710 tons, as against 6987 tons shipped in the corresponding period of last year, showing a decrease of 2277 tons. Over the Cumberland and Pennsylvania Railroad, for the same period, the shipments were 43,642 tons, against 51,047 tons shipped in 1874, a decrease of 7405 tons. The aggregate amount of Cumberland Coal shipped by the various companies so far this year amounts to 1,231,123 tons.

PHILADELPHIA.

PHILADELPHIA, July 27, 1875.

The Iron market begins to show unmistakable signs of returning prosperity, just as it began to break some six months before the panic. This statement will very likely be denied in the trade—the truth generally is—but the future will bear us out. The signs referred to are the very general belief that the lowest prices possible are now ruling for Pig Metal, and that the grain movement is a legitimate trade which will restore prosperity to all branches, and that this effect is already felt in a measure. Moreover, the stocks of Pig Iron generally reported are not visible at the furnaces in the Lehigh, and if they exist it must be entirely in storage yard, which is not believed to be the case. Foundry Pig is scarce, and the consumers of this grade are making efforts to secure all they can before an advance comes. It is not believed or expected that we are to have a repetition of the great advance of 1872, nor is it desirable for the trade; but it is quite certain that with the proportion of stacks out of blast that are reliably reported, and the improved consuming demand that exists, there will not be Pig Metal enough to supply the wants of the country before the close of navigation. Forge Irons are not so active, because of their greater plenty, always common at this season of the year, and also because most of the city mills, and those coming under the Philadelphia rate for puddling, have shut down on their puddlers to reduce cost, and are buying Muck Bar from localities where lower rates prevail. Moreover, some of the largest pipe orders of the season are now on the market, both for Eastern and Western cities, which will consume a very large amount of Pig Iron. In view of this state of affairs any further movement to depress trade may be considered as a direct effort to create a sharp advance in prices very shortly. Still more noticeable is the improvement in Manufactured Irons, so far as Rails are concerned. This movement originated in the West, and it is reliably stated that all or nearly all the Rail mills west of Pittsburgh have orders on hand from four to five months ahead, and we hear of $54, cash, per ton being asked for an order of 4000 tons Iron Rails in Cleveland, during the week, with considerable cash sales at $50 to $51. Another large order of 6000 tons is just placed in an Eastern mill, at these prices. While Steel Rails can be put in the market at $70 to $71, and we hear of offers for future delivery still lower, it is fair to believe that the demand for Rails can by no means be supplied from the Steel works of the country alone, and that hence a good Iron Rail trade will be had until, as is probable, most of the mills rolling Iron Rails will add a Steel plant of some kind, and produce Steel Rails. The Bar mills of the city occupy the same position as to their puddlers as the Pittsburgh mills did some months since, with the difference that they can obtain a plentiful supply of Muck Bar at lower prices than they can make it. Under previous contracts the puddlers in the city mills received a full $1 per ton more than was paid in the country, and for no valid reason. This the mill owners have determined no longer to pay, and unless the puddlers accept the situation soon, we may look for a fairly active trade in Muck Bar, especially as Bars are very likely to stiffen under the general improvement. From the situation of the market it will be seen that the large furnace companies, who have been maintaining prices firmly, did not do so without reason, and that those who count on any lower rates will probably be caught short. Prices are nominally without change, and we quote as follows:

PIG METAL.—No. 1 Foundry, $27; No. 2, $25; Gray Forge, $23·50 to $24.

BARS.—2·6c. to 2·8c. per lb.

RAILS.—$48 to $51, at works.

OLD RAILS.—$27 to $28.

SCRAP.—Scarcer at $31 to $32.

Among the sales were the following at actual sale note prices, viz.: *Pig Iron*—No. 1 Foundry, 1500 tons, $26·50; 500 do. at $27; 1000 do., $26·50; No. 2 Foundry, 1250 tons, $24·50; 600 tons, $24·50; 300 tons, $24; Gray Forge, 2000 tons at $23·50, and some large lots of Pipe Irons on private terms. *Rails*—Cash sales and four months' sales, for immediate delivery, of lots of 400, 500, 1000 and 500 tons at from $48 to $50; 6000 tons for future delivery, to a Pennsylvania mill, and 4000 tons to a Western mill, both private. *Old Rails*—500 tons, special lot, at $28, here. *Scrap*—1000 tons rough ordinary at $28; 300 tons choice No. 1 at $32·50, and some Boiler Scrap at $37.

PITTSBURGH.

PITTSBURGH, July 26, 1875.

PIG IRON.—There is but little to write in regard to Pig Iron that is new or important. Trade continues quiet, as it nearly always is at this particular time, but the general tone of the market continues favorable to the producing interest. The consumption continues in excess of the production, and with stocks, both in first and second hands, very much reduced, as compared with what they have been for some years past, producers feel confident of being able to realize better prices within the next few weeks. No very marked advance is anticipated, but for the reasons stated, furnacemen are confident of realizing $25, 4 mos., as soon as the mills commence to buy, and this they cannot much longer delay, as they are nearly all out of stock. The fact is, mill owners very generally concede that raw Iron is not likely to go any lower for the present, at least, and that an advance is more probable than a decline, and there would be no difficulty in placing considerable, especially for future delivery, at $24, 4 mos., the ruling rate for several months past, but furnacemen generally are holding at $25, 4 mos., and this the former cannot see their way clear to pay.

QUOTATIONS.

No. 1 Foundry	$27 @ $28—4 mos.
No. 2 Foundry	25 @ 25—4 mos.
Gray Forge	24 @ 25—4 mos.
White and Mottled	22 @ 23—4 mos.
Hot Blast charcoal	28 @ 30—4 mos.
Cold Blast charcoal	35 @ 40—4 mos.

The sales reported for the past week were mostly small lots, indicating that the mills continue to buy only to supply their immediate wants, although, as already stated, Mill Iron, especially anything of round lots, say one or two thousand tons, would be more difficult to buy than sell at the current rate, $24, 4 months. Foundry Irons continue very dull, but it is expected there will be an improved demand this fall, and producers hope for better prices.

MANUFACTURED IRON.—The general situation has not varied much during the past week, and while business is not active, it is all that can be expected; the mills have about all they can do, working single turn, and manufacturers are hopeful of a good fall trade. With good crops and money easy, it is expected that there will be an increased demand this fall, and the fact that prices are very low, and are more likely to advance than to decline, will have a tendency to stimulate trade; and, then, the fact that stocks, both in the hands of jobbers and consumers, are very much reduced, strengthens the belief in an active fall business. Prices are lower now than they have been at any time since the war, and, with a single exception, as low as they ever were, and with the raw article stiffening the products are sympathizing; Bars quotable at 2·25c. to 2·30c., Pittsburgh list.

NAILS.—There is a very fair trade for this season of the year; some of the factories are still running, and stocks continue light, manufacturers having had sufficient orders to absorb their production, and some of them are still behind their orders. No change in prices, $2·90 to $3, sixty days, with the usual discount of 2 per cent. for cash. It is expected that there will be an increased trade this fall, and the fact that stocks, both in the hands of manufacturers, jobbers and consumers, are comparatively light, and the feeling gaining strength that prices have touched the lowest notch, makes it very probable that these expectations will be fully realized. Shoenberger & Co. stopped last week to make repairs, but will start up again about the 1st of August, and Chess, Smyth & Co. and Zug & Co., as is their custom, will stop a few weeks next month to take an account of stock and make repairs.

SCRAP IRON—Continues exceedingly dull, as it generally is at this particular time, and no improvement is expected until next month—possibly September. Stocks in the hands of dealers are light, and the general tone of the market is steady, in sympathy with Pig Iron. No. 1 Wrought Railroad Scrap quotable at $29 to $30 per ton, four months, delivered free at mills Car Wheels, $24 to $25.

STEEL.—There is nothing new in this branch of business deserving of special notice; trade is fair and increasing, and the mills generally appear to be busy.

A. G. Hatry, Iron Broker, Pittsburgh, Pa., has issued a circular under date of 20th instant, from which we extract as follows:

In future, I shall issue a quarterly trade circular of the market reports, and in this way keep my friends and patrons posted of the changes of market values.

At present, trade is rather dull, and orders are not coming in as plenty as some weeks back, but this is the dull season, prices are in consequence very low, and in my opinion the time to put in orders.

At present, prices are ruling about as follows:

Merchant Bar Iron, assorted orders, 2·35c. to 2·40c. rates, Eastern classification, 30 days.

Hoop and Bands, assorted orders, 3 to 6 cents per lb., according to size.

Nails are scarce and firm at $3 rates, net, for 10d., 60 days, or 2 per cent. off for cash.

Sheet Iron is firm at 3 8-10 to 4 cents for No. 24, as a basis, 30 days.

The Pittsburgh *Commercial* of July 24, says: The market for pig metal is still about the same as it has been for the past two or three weeks. There being a very slack demand, the sales are limited to small lots required for immediate use. While the trade is very dull here, we hear of contracts for considerable lots in other markets. One furnace company in the valley between here and the lakes is shipping a large lot to Buffalo, and another reports a sale of 1600 to 2000 tons to go down the river. We are without information as to prices of the above named lots, but understand that it is considerably better than $24, four months, delivered here. We are reported the following sales:

BITUMINOUS COAL SMELTED FROM L. S. ORE.

250 tons gray forge	$24·00—4 mos.
200 tons gray forge	24·00—5 mos.
150 tons white	private terms.
140 tons gray forge	23·00—cash.
100 tons close gray	23·50—4 mos.
100 tons foundry	25·00—4 mos.
100 tons open gray forge	23·50—cash.
100 tons No. 2 foundry	26·00—5 mos.
30 tons No. 1 foundry	27·00—4 mos.
10 tons No. 2 foundry	25·00—4 mos.
10 tons No. 2 foundry	24·50—4 mos.

CONNELLSVILLE COKE.

60 tons close and mottled	22·50—4 mos.
40 tons gray forge	24·00—4 mos.
10 tons No. 2 foundry	24·00—cash.
10 tons No. 1 foundry	26·00—4 mos.

CHARCOAL.

10 tons No. 1 foundry H. B.	30 00—4 mos.

RICHMOND.

Mr. ASA SNYDER, Iron Merchant and Furnace Agent, Richmond, Va., writes as follows under date of July 26: The stock of first class Wheel Irons here has been greatly reduced. No important order can now be filled from stock in hand. Furnaces out of blast will remain so indefinitely, unless a full blast can be contracted for at figures largely in advance of present prices. Quotations remain as before:

Virginia cold blast Charcoal Pig Irons		$30·00 @ 35·00
" hot " "		28·00 @ 32·00
Va. hot blast Coke Pig Iron,	No. 1 ex.	26·00 @ 27·00
" " " "	No. 2 ex.	25·00 @ 26·00
" " " "	No. 3 ex.	24·00 @ 25·00
Virginia Anthracite,	No. 1 ex.	27·00 @ 28·00
" "	No. 2 ex.	26 00 @ 27·00

BOSTON.

JULY 22.—*Pig* has had a quiet week again, although holders talk as though the prices at the furnaces had advanced 50c. per ton. There is no ripple of change to the tone here, which is as it has been for two months, rather nominal, while the best brands are offering in 25 and 50 ton lots at primary points at $27. On wharf here: No. 1, $29 to $31; No. 2, $24 to $27; and Gray Forge, $21 to $24. *Bar* has had a trifling business—just enough to keep the few people about the warehouses not excursioning a little busy. The market values are settling closer toward $58, and losing that tone of strength which carried the majority of transactions nearer and nearer toward $60. The reports from abroad that a reduction had been made of £1 per ton in English iron have no effect here, as more than this decline had been discounted here in June. Common Iron is listless and easy, quoting at $52 to $56, as to size. *Steel* is very dull in all excepting small machine sizes, in which a small inquiry has been shown this week. We quote American Tool, 15c. to 15½c.; American Machinery, 9½c. to 10c.; do. Cast Tires, 8¼c. to 12½c.; Sweet's Excelsior Tire, 7c. to 7½c.; English Tool, 16c. to 17c. *Copper* is very listless, and although holders are firm at 22¾c. for spot and 23c. for futures, they cannot stimulate a ripple of business. For manufactured we quote New Sheathing, 30c.; Bolts and Braziers, 31c.; Yellow Metal Bolts, 28c. to 29c. *Lead* is easy, but not yet quotably lower. Pig, 6c. for Domestic, and 6¾c. for Foreign; Sheet and Pipe Lead, 9½c., currency; Tin Lined Pipe, 16¼c.; Bar Lead, 6½c., less usual trade or 10 per cent. discount. *Antimony* is firm at 13c., with very little inquiry. *Spelter* is firm at $7·55, 30 days, and $7·40, prompt cash, all currency. Silesian is unchanged, quoting nominally $7·30. *Tin* is very dull and easy. Plates are dull. We quote Straits, 20c.; Banca, 24½c.; Refined English, 19¾c., gold. Plates are active; we quote Charcoal I. C., $9 50 to $10; Coke, $7·75 to $8; and Terne at $8·50 to $11, gold.—*Com. Bulletin.*

CINCINNATI.

Messrs. L. R. HULL & CO., under date of July 26, write us as follows: PIG IRON.—There has been no material change in the market during the past week. Prices range about the same, and the demand for Foundry and Mill Iron continues fair for this season of the year. Furnace owners are not disposed to make contracts at present prices for deliveries running longer than 60 days, and buyers generally are inclined to purchase to that extent.

HOT BLAST CHARCOAL.

Hanging Rock	No. 1	₱ ton.	$27·00 @ 28·00—4 mos.
" "	No. 2		25·00 @ 26·00—4 mos.
" "	Forge		23·00 @ 24·00—4 mos.
Virginia	No. 1		26·00 @ —4 mos.
"	No. 2		24·00 @ —4 mos.
"	Forge		23·00 @ —4 mos.
Tennessee	No. 1		26·00 @ —4 mos.
"	Forge		23·00 @ —4 mos.
Alabama	No. 1		26·00 @ —4 mos.
Missouri	No. 1		27·00 @ 28·00—4 mos.
"	No. 2		26·00 @ 27·00—4 mos.

HOT BLAST STONE COAL.

Missouri	No. 1	₱ ton.	$27·00 @ —4 mos.
"	Forge		26·00 @ —4 mos.
Ohio	No. 1		24·00 @ 27·00—4 mos.
"	Forge		23·00 @ 26·00—4 mos.
Am. Scotch,	No. 1		25·00 @ 26·00—4 mos.

COLD BLAST CHARCOAL.

Hanging Rock Car Wheel		₱ tn.	$35·00 @ 40·00—4 mos.
Missouri	"	"	35·00 @ 40·00—4 mos.
Kentucky	"	"	35·00 @ 40·00—4 mos.
Tennessee	"	"	30·00 @ 40·00—4 mos.
Georgia	"	"	30·00 @ 40·00—4 mos.
Alabama	"	"	30·00 @ 40·00—4 mos.
Machinery and Forge			30·00 @ 35·00—4 mos
Blooms			70·00 @ 90·00—4 mos.

ST. LOUIS.

Messrs. SPOONER & COLLINS, Iron commission agents, 409 North Third street, St. Louis, under date of July 16, report the Iron market as follows: Our market still continues dull, with no prospect of a change until next month, when we look for a lively trade. Prices remain quiet at our quotations. We quote on four months' time:

Mo. Stone Coal,	No. 1 F'dry.	$28·00 @ 29·00—4 mos.
" "	No. 2 F'dry.	26·00 @ 27·00—4 mos.
" "	No. 1 Mill	25·00 @ 26·00—4 mos.
" Charcoal,	No. 1 F'dry	28·00 @ 29·00—4 mos.
" "	No. 2 F'dry	26·00 @ 27·00—4 mos.
" "	No. 1 Mill	25·00 @ 26·00—4 mos.
Tenn. Charcoal	No. 1 F'dry.	28·00 @ 29·00—4 mos.
" "	No. 2 F'dry.	26·00 @ 27·00—4 mos.
H. R. "	No. 1 F'dry.	29·00 @ —4 mos.
H. R. "	No. 2 F'dry.	27·00 @ —4 mos.
H. R. "	No. 1 Mill	26·00 @ —4 mos.
Massillon,	No. 1 Foundry	36·00 @ 37·00—4 mos.
"	B, No. 1 Foundry.	34·00 @ 36·00—4 mos.
"	No. 2 Foundry	33·00 @ 34·00—4 mos.
Cold Blast Car Wheel.	Mo.	37·00 @ 40·00—4 mos.
" "	Tenn.	35·00 @ 40·00—4 mos.
" "	Hanging Rock	53·00 @ 55·00—4 mos.
Mo Charcoal Blooms		75·00 @ 85·00—4 mos.
Machinery Cast Scrap		·90c. per lb.
Light Cast "		·60c. "
No. 1 Wrought "		1·10c. "
Stove Plates		¾c. "

CLEVELAND.

Messrs. C. E. BINGHAM & CO., 25 West Main street, under date of July 26, quote the Iron market as follows, 4 mos. time:

FOUNDRY IRON.

No. 1 Lake Superior Charcoal	$32·00—4 m.
No. 2 " "	31·50—4 m.
No. 1 Anthracite	29·50—4 m.
No. 2 "	27·50—4 m.
No. 1 Bituminous	29·00—4 m.
No. 2 "	27·00—4 m.
No. 1, Cherry Valley Am. Scotch	31·00—4 m.
B—1 " "	28·50—4 m.
No. 2, " "	27·50—4 m.
No. 1 Massillon	30·50—4 m.
B—1	27·50—4 m.
No. 2	25·50—4 m.

CAR WHEEL AND MALLEABLE IRON.

No. 3 Lake Superior Charcoal	$31·50—4 m.
No. 4 " "	32·50—4 m.
Nos. 5 & 6 " "	33·00—4 m.

BESSEMER IRON.

Nos. 1 and 2 Lake Superior Charcoal	$31·75—4 m.

FORGE IRON.

No. 1 Gray	$25·00—4 m.
White and Mottled	23·50—4 m.

BALTIMORE.

Messrs. WYETH & BROTHER, Iron and Steel merchants, South Charles and Lombard streets, report us the following prices under date of July 27: We continue to report a dull and quiet market, with small sales to satisfy present wants, and these are made at about cost to dealers. We quote the market depressed, with unchanged list:

AMERICAN REFINED BAR IRON.

1 to 6 wide by ¾ to 1 thick	2·6-10 to 2 7-10c. ₱ lb.
1 to 4¾ wide by 1¾ to 2 thick	2·6-10 to 2 7-10c. "
Round and square, ordinary sizes, from ¾ to 2 inclusive	2 6-10 to 2 7-10c. "
Hoop Iron, 1¾ wide and upward	4¼ to 4¾c. "
Band Iron, from 1¾ to 4 in. wide	3¼ to 3¾c. "
Horse Shoe Iron ¾ to 1 wide by ¾ to ¾ thick	4 to 4¼c. "
Norway Nail Rods	7 to 7¾c. "
Black Diamond Cast Steel, Flats, Squares and Octagon, ordinary sizes	15¾ to 16c. "
Machinery Steel	11 to 11¾c. "
Cast Spring Steel	10 to 10¾c. "
Homogeneous Steel Plate	10¾c. "
Perkins' Horse Shoes, per keg of 100 lbs	$5·00
" Mule Shoes " "	6·00
Common Horse Nails, from 14c. to 18c. per pound.	

Putnam Horse Nails	10	9	8	7	6	per ₱.
	23	24	25	26	28c.	
Globe Horse Nails	23	24	25	26	28c.	per ₱.
R. R. Spikes	5¼ by 9-16 at 3c to 3¼c. per lb.					

Messrs. R. C. HOFFMAN & Co., Iron and commission merchants, Nos. 23 and 25 South Frederick street, report the Pig Iron market as follows, under date of July 26: We have no change to note in the iron market since our last report. Market dull. We quote:

Baltimore Charcoal	$32·00 @ 35·00
Virginia "	30·00 @ 35·00
Anthracite No. 1	27·00 @ 28·00
" No. 2	25·00 @ 26·00
" No. 3	22·00 @ 24·00
White and Mottled	20·00 @ 22·00

LOUISVILLE.

Messrs. GEO. H. HULL & Co., under date of July 26, writes us as follows: The market is very dull, but without change in prices. The usual time, 4 mos., is allowed on quotations below:

HOT BLAST CHARCOAL.

No. 1 F'dry, from Hanging Rock Ores	$27·00 @ 28·00
" 2 " " " "	25·00 @ 26·00
" 1 Mill, " " "	23·00 @ 24·00
" 1 F'dry, from Alabama, Georgia and Tennessee Ores	25·00 @ 26·00
" 2 F'dry, from Alabama, Georgia and Tennessee Ores	24·00 @ 25·00
" 1 Mill, from Alabama, Georgia and Tennessee Ores	23·00 @ 24·00

HOT BLAST STONE COAL AND COKE.

No. 1 F'dry, from Hanging Rock Ores	$25·00 @ 26·00
" 2 " " " "	24·00 @ 25·00
" 1 Mill, " " "	23·00 @ 24·00
" 1 F'dry, from Alabama, Georgia and Tennessee Ores	25·00 @ 26·00
" 2 F'dry, from Alabama, Georgia and Tennessee Ores	24·00 @ 25·00
" 1 Mill, from Alabama, Georgia and Tennessee Ores	23·00 @ 24·00
No. 1 F dry, from Missouri Ores	27·00 @ 28·00
" 2 " " "	26·00 @ 27·00
" 1 Mill, " "	26·00 @ 27·00

COLD BLAST CHARCOAL.

Car Wheel from Hanging Rock Ores	35·00 @ 40·00
" " Tennessee Ores	30·00 @ 33·00
" " Alabama and Georgia Ores	30·00 @ 35·00
Car Wheel from Kentucky Ores	28·00 @ 35·00

FOREIGN.

FRANCE.

(Moniteur des Interets Materiels.)

PARIS, July 11, 1875.—*Metals.*—The general Metal markets of Europe are unfavorably influenced by the failures in England, unfortunately already quite numerous, and threatening to become more so still. Fresh disasters are daily expected; uneasiness and uncertainty have taken sway of the English markets, and curtail the volume of dealings. The immediate consequence of this state of affairs is a wide-spread reaction in all the European metal markets, the quotations being ruled by the London ones, and the gloomy accounts from beyond the channel paralyze transactions. *Copper.*—Chili Bars have nevertheless been sustained at £81. 10/, but this has to be viewed as a merely nominal figure. The cable announcement of charters on the West Coast has contributed a good deal toward increasing the feeling of uncertainty which had set in at the leading Copper centers of the Continent, amounting to 4000 tons for the latter half of June. Copper here is declining, and there is hardly anything transpiring therein. We quote, deliverable at Havre, Chili Bars, 215 francs; Common ditto, 212·50; Ingots, 225; English Tough Cake, 222·50, and pure Corocoro Ore, 215. The same quiet heretofore noted prevails at Havre. Copper is neglected at Marseilles on the basis of 220 francs for small Ingots. *Tin* is neglected here. We quote Banca, deliverable here, 228 francs; Straits, 217·50, and English, at Havre or Rouen, 225 francs. Marseilles as quiet as ever, at 220 Straits and Billiton. Lead is rather firmer in England at £22, English Pig, and £21. 10/, Spanish. An unbroken quiet is noticeable here, at Paris. French deliverable here 56 francs; Spanish, at Havre, 55·50; and English 55·50. The Marseilles market continues inanimate, but prices, despite the absence of orders, are sustained on the basis of 51½ francs.—*Spelter.*—The Spelter markets have been quiescent throughout Europe, although keeping up the same degree of firmness hitherto observable. This is due to the knowledge that production cannot easily outrun consumption, as the metal is now situated. We have little to report from either Paris or Havre; Silesian ranging as before between 62·50 and 63 francs. At Marseilles there is no change. *Iron.*—What stir there has been of late in the French Iron markets seems to be diminishing as we proceed; prices have dropped to an extraordinarily low point without exciting much interest. Here, we are duller than ever, without alteration in rates. Pig Iron in the Meurthe and Moselle is still quoted 70/, while for second casting it can be sold at 92 francs. First quality Merchants' Iron brings, on an average, 207 francs. The foundries are in operation, but do not do much. Cast Iron Pipe, which not long ago was in good demand for Germany, is now is less request and sells slowly. St. Dizier maintains its favorable position, especially as regards Merchants' Iron. The shops turning out railroad material, as well as for gas works and architectural purposes, keep up the activity previously alluded to. Hollowware, on the other hand, remains neglected. At the Center Iron industry is languishing. *Coal.*—Our principal companies are firm with available Coal, in hopes of an immediate revival in industrial matters, especially Sugar refining, but are ready to shade prices on winter deliveries. The smaller companies, not as flush from a financial point of view, are obliged to meet the market as it may prove to be in their different localities. We are quiet here.

BELGIUM.

(Revue Universelle).

BRUSSELS, July 11, 1875.—*Iron.*—Despite the efforts being made just at present to impart a greater stimulus to our export trade, we have little cause to feel at all sanguine; on the contrary, whatever revival there may be will come slowly; but, at all events, we are still more favorably situated than the countries surrounding us, if we except our next door neighbor, the little Duchy of Luxembourg, now furnishing such considerable quantities of Iron Ore to our blast furnaces, and competing so successfully with us in Pig Iron. In referring to last year's Belgian Iron export statistics, it will be found that there has been an increase in rails to Holland, Switzerland, Turkey, Brazil and Italy—in the latter case of 20,000 tons. Rail works have not got the facilities for storing which other Iron manufactories possess; hence, it is to be hoped that freights to the frontier will be lowered, so as to enable us to ship off at moderate rates the quantities of Rails that may accumulate on our hands; the more so, as there is a prospect of Italy, in particular, taking large amounts. Our province of Namur has turned out 10 per cent. less Iron last year than the year previous. The four blast furnaces have produced 45,136 tons of Pig Iron, employing together 227 men. The 30 foundries have turned out 4500 tons of Castings, &c. The five Iron works have, in the Dinant district, produced 43,210 tons Forged Iron, employing 1053 men. *Coal* remains inactive, nor do we expect much of an improvement for the fall campaign, as long as general industries in Belgium do not pick up. The North of France is competing most vigorously with our Coal companies. The mines of the North and the Pas de Calais have not been in a position to curtail production, and in order to avoid an accumulation of stock, they have lowered prices considerably.

GERMANY.

(Borsenhalle.)

HAMBURGH, July 10, 1875.—*Metals.*—The intended duty modifications in the Iron trade still occupy a large share of attention in industrial circles, and lead to a good deal of discussion as to the merits and demerits of protection and free trade. The proposed suppression of the import duty on Iron and Steel meets with a good deal of opposition, in which even the president of the Rhenish Railroad has joined. Metals have, on the whole, been languid, owing to the situation in England, where failures continue, and gradually produce a drooping tendency in most articles in the metal line. *Copper* has varied but little; holders would, we believe, be willing to make some concessions. We quote Drontheim 94 marks; Minnesota, 110; and Quincy, 100. Stettin remains steady at 96 to 100 marks. *Tin.*—Consumers have been able to buy below the official quotations, which are the following: Banca, 98 to 100 marks; English, 96 to 97. The remaining German markets are unaltered. *Lead.*—The lot of Mexican we alluded to has remained unsold, holders asking too much for it. We remain very quiet, and quote: German, 23·75 to 24·50; and English, 25·50 to 25·60. Stettin quotes Spanish, 27; and German, 24 to 25 marks. *Spelter.*—There is the same degree of firmness in our markets, but the dealings are restricted. We quote here, without change, 24·30 to 24·50 marks.

HOLLAND.

(Koch & Vlierboom.)

ROTTERDAM, July 13, 1875.—*Tin.*—Very little transpires; a few lots of Banca, on the spot, have changed hands at 50¾ guiders, and deliverable from the coming September auction at 50; while Billiton, September delivery, has been done at 47½. The Dutch Trading Society will sell on the 28th instant 22,600 slabs Banca.

PRICE OF BANCA IN HOLLAND, IN GUILDERS, THE 50 KILOS.

	1870.	1871.	1872.	1873.	1874.	1875.
1 January	65	77	87⅛	85⅛	70	57⅛
1 February	64⅜	78	86	87⅛	70	56¾
1 March	70	77¾	85	84	62	54
1 April	65⅛	76½	93	87	53	51½
1 May	78¾	76¾	96	84	57	50¾
1 June	78⅜	76	95⅛	80	58½	50
1 July	78⅝	79⅜	94½	83⅜	60	50¾
1 August	69	80½	96	79¾	56½	
1 September	75	80	93½	79	57	
1 October	74½	80⅜	94½	74½	56½	
1 November	73½	81¾	92	72½	58	
1 December	73½	88	87	67½	58⅜	

EAST INDIES.

(Sandilands, Buttery & Co.)

PENANG, May 31, 1875. *Tin* has undergone a good deal of alteration, supplies have been comparatively scanty; in the beginning purchases were made at $22·07½ to $22 per picul for unsmelted, but on the departure of last mail the metal closed weaker at $21·80. Since then prices slightly hardened in sympathy with firmer quotations from home, and transactions were reported at $21·80 to $22·10 per picul, but the market closes quiet again at $22 per picul. The stock in the bazaar amounts to 2000 piculs.

Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(From our Regular Correspondent.)

SHEFFIELD, ENG., July 12, 1875.

THE IRON MASTERS' MEETINGS

have been held, with the general result of which you were instantly made aware by cable. At the Wolverhampton meeting the South Staffordshire producers mustered in pretty strong force, and they did not keep their possible customers long in suspense, for at the very outset of the 'change they made it known that finished iron would be lowered to the extent of 20/ per ton, with hoops and plates in proportion. This, thus reduced the quotations of such first-class houses as Messrs. Barrows & Co., G. B. Thorneycroft & Co., etc., to £10 for best bars, instead of £11 as heretofore, and left the Round Oak iron, of Earl Dudley, at £10. 12/6. The sheet manufacturers, or at least such of them as happened to be solely engaged in that branch of business, dissented from the conclusions which had led to this drop, and held a caucus at which they determined not to follow the lead thus set out. Messrs. E. P. & W. Baldwin, of the Wilden Works, Stourport, nevertheless, announced a reduction of £1 in the price of their best sheets, and I hear that another firm of less importance has followed suit. The bulk, however, of the sheet houses remain firm, declaring that in view of the present rate of wages and cost of materials there can at present be no further reductions in prices. The meeting at Birmingham on the following day fully confirmed these views of the business standpoint, although I hardly need state that most of the leading makers of Staffordshire and Shropshire pigs decided to put down their list figures by 10/ per ton, the fact not being of other than indirect interest to your trade. This alteration leaves Lilleshall hot blast pig at £4. 10/ per ton at the works. In consequence of these revisions a few tolerably good orders for best Staffordshire bars, for hoops, plates and a few lots of sheets, were given out. The merchant buyers still grumble, discontentedly averring their belief that the relief just afforded is clearly insufficient to re-establish the trade on a firm, sound and moving basis, and that before the advent of another quarter day a further 20/ will have to be taken off the list rates. These views are, of course, necessarily inspired by the desires of those who express them, yet they are giving them a certain degree of force by abstaining from entering into the market, and by stating that they cannot advise their customers to buy bars at so high a figure as £10. The producers naturally give these malcontents the retort courteous, and say that all their "rhodomontade" may be dispensed with in face of the fact that without further reductions in the price of fuel and of labor it is utterly impossible to make any additional concession in favor of consumers. They also point out to the objectors that the finished iron workers are apparently quite determined not to submit to a reduction in their rate of pay, and that although they express every willingness to let the question go to arbitration, yet they evidently intend not to abide by the arbitrator's *pat* unless it be wholly or mainly in their own favor. "Thus," sum up the sellers, "we cannot give buyers any hope of further alterations in prices in a downward direction. They had better buy at once." But the buyers are wary, experienced gentlemen, and they can play a "waiting game" with the best of their opponents or competators.

THE BOARD OF TRADE RETURNS FOR JUNE

and the *six* months terminating on the last day of that month, are just issued. These latter returns, generally speaking, show that the value of the hardware exports was about £7000 higher than in the corresponding period of last year, although the United States fell off 4 per cent.; Germany, 4 per cent.; the Argentine Republic, 24 per cent.; India, 5 per cent.; and the "other countries" section nearly 12 per cent. On the other hand, there was an increase of 6 per cent., or a trifle over £39,000 in value in our transactions in these goods, with Australia; not less than 45 per cent. with our North American dependencies, amounting to the value of £50,000; about 21 per cent. with Brazil, and nearly 77 per cent. with the Spanish West Indies. In the month of June alone the aggregate augmentation has been about 3 per cent. (in hardware) over the similar exports of June, 1874, the chief increases having been 433 per cent. with the Spanish West Indies, 43 per cent. with Germany, 28 per cent. with India, and 14 per cent. with Russia. The Argentine Republic has fallen off by 53 per cent.; Brazil, 6 per cent.; Australia, 5 per cent.; and "other countries," 7 per cent. In the half year there was a decline of 2 per cent. in mill-work and machinery, but in machinery (not steam engines) there was a slight increase, mainly attributable to the demand of India, Russia and France. There was a great falling off in this branch with Holland, Germany and Belgium. In the last month (June), however, there has been a clear improvement under both heads. The only figures which have, additionally to those just worked out, reached me are the following, giving quantities and values for the six months of each year indicated:

	Quantities		Values.	
	1874.	1875.	1874.	1875.
Coal, &c, tons	6,171,526	6,197,209	5,823,254	4,348,290
Copper, unwro't..cwt.	98,099	99,204	436,587	441,539
Copp'r, wro't.	110,024	113,787	553,481	573,179
Mixed yellow metal sh'thing.....cwt.	145,716	139,957	598,284	553,874
Hardware and cutlery	....	....	2,082,667	2,089,149
Iron, pig, tons	319,898	432,599	1,661,387	1,696,621
Bar, angle, &c	114,485	128,688	1,472,500	1,323,532
Railroad.....	427,267	259,307	5,494,764	2,683,928
Iron or steel wire (except tel'g'h wire) galv'ized or not	14,714	21,960	335,010	406,180
Hoops, sh'ets, &c.....	68,809	94,601	1,995,757	1,576,046
Tin plates.....	63,534	72,130	1,994,721	2,069,201
Cast or wro't.	129,652	118,251	2,553,421	2,191,524
Old, for remanuf'ture	14,553	8,845	90,489	43 930
Steel, unwro't tons	14,247	14,850	570,769	545,592
Manufactures of steel or iron.....	4,561	5,249	376,024	339,520
Lead—pig rolled, &c. tons.	20,248	14,272	466,403	332,324
MACHINERY.				
Steam engines	....	....	1,523,191	1,363,376
Other kinds..	....	...	3,132,745	3,182,237
Teleg'ph wire and apparatus.....	425,172	447,100	1,579,754	626,831
Tin, unwro't, cwts.....	89,429	55,130	486,886	261,787

The following relates to the export of hardware and cutlery:

	1873. £	1874. £	1875. £
Russia	71,512	46,151	40,336
Germany	174,077	131,539	125,008
Holland	58,056	49,324	49 954
France	78,438	66,571	67,428
Spain and Canaries	49,897	54,029	48,460
United States	412,352	303,935	289,590
Spanish West India Islands	73,571	31,428	57,603
Brazil	142,566	125,580	151,378
Argentine Republic	103,522	69,986	52,508
British North America	108,032	111,345	161,458
British India	987,11	151,841	143,563
Australia	290,956	295,257	334,187
Other countries	776,729	645,681	569,676
Total	2,429,419	2,083,667	2,089,149

THE SCOTCH PIG IRON MARKET

has been fairly quiet but steady, warrant quotations having remained within a shilling in either direction from 60/ for cash. Makers' iron has continued firm throughout the whole of the same period, and the shipping trade is manifestly brisk, judging from the total exports of last week, comparative particulars of which are furnished below. Freights are on the same basis as hitherto, as also is the price of ballast pig. There are at the present time 117 furnaces in blast in Scotland, as against 72 at the same date of last year. Connal's stores contain 33,089 tons, as compared with 32,911 tons on the same date of 1874, the former figures being exclusive of the stocks in makers' yards.

Writing from Glasgow July 19, Messrs. James Watson & Co. said: "The warrant market has been comparatively steady this week, the price fluctuating between 60/9 and 59/9, cash, closing to-day buyers at 60/3, sellers 60/6. Makers are firm in their quotations, and the exports are large compared with the same season last year. Shipments last week were 14,101 tons, against 6112 tons in the corresponding week of 1874. We quote:

	No. 1.	No. 3
G. M. B., at Glasgow	62/	61/
Gartsherrie, "	67/6	62/
Coltness, "	69/	65/
Summerlee, "	66/	62/6
Langloan, "	66/6	62/6
Carnbroe, "	63/6	62/6
Calder, at Port Dundas	67/6	62/6
Glengarnock, at Ardrossan	68/6	62/6
Eglinton, "	62/	60/6
Dalmellington, "	61/6	60/6
Shotts, at Leith	67/6	64/6
Kinnell at Boness	62/6	59/

Messrs. Wm. Colvin & Co. (Glasgow, July 13) say: "The warrant market gave way a little toward the end of last week, the price touching 60/, closing, however, on Friday with buyers at 60/3. This week there has been very little animation, a limited business done from 60/ to 60/6, cash, closing this afternoon with buyers at 60/3 and sellers at 60/6. The price of makers' iron is steady, with little change to report. On account of the annual holidays, there will be no warrant market on Friday and Monday first, and Saturday will be a close holiday with all classes."

	Deliverable alongside. No. 1.	No. 3.
G. M. B., at Glasgow	62/	60/6
Gartsherrie "	68/6	62/6
Coltness, "	69/	65/
Summerlee, "	66/6	62/
Langloan, "	67/	62/
Carnbroe, "	64/	62/
Monkland "	62/	61/
Clyde "	64/	61/6
Govan, at Broomielaw	62/6	61/
Calder, at Port Dundas	68/	62/
Glengarnock, at Ardrossan	67/6	63/6
Eglinton, "	62/	60/
Dalmellington, "	61/	59/
Carron, at Grangemouth, selected	67/6	..
Shotts, at Leith	68/	64/
Kinnell, at Bo'ness	62/6	59/6
Bar Iron	£8. 10/ to £9. 0/	
Nail Rods	£9. 0/.	

SHIPMENTS.

	Tons.
Week ending July 10, 1875	13,215
" July 11, 1874	9,352
Increase	3,863
Total increase for 1875	76,717

Messrs. John E. Swan & Bros.' (Limited) prices current gives the following information:

Glasgow Brands.	Furnaces Blowing, 117	Furnaces Out 40.	Furnaces Built, 157.	Prices. No. 1.	No. 3.	No. 4
Gartsherrie	13	3	16	68/	62/	63/6
Coltness	12	0	12	69/	64/6	..
Summerlee	6	2	8	66/	62/	64/
Langloan	7	1	8	67/	62/	64/
Govan	4	1	5	62/	60/6	62/
Calder	2	6	8	*68/	62/	64/
Shotts (Bess'mer)	5	2	7	82/6	..	..
Shotts (Ordinary)				68/	64/	64/
Carnbroe	4	2	6	63/6	61/6	64/
Wishaw	2	1	3	..	..	..
Monkland	9	0	9	61/6	60/6	60/
Chapelhall				..	..	..
Clyde	6	0	6	64/	61/	60/
Quarter-Clyde	4	1	5	61/6	60/6	60/

*f. o. b. Glasgow, 1/ per ton, extra.

Glasgow Warrants, 3-5 No. 1; 2-5 No. 3, g. m. b., 60/3.

WEST COAST BRANDS—*f. o. b. Ardrossan.*

Glengarnock	Brand'd	7	2	9	68/	62/	63/
Ardeer		4	1	5			
Eglinton		6	2	8			
Lugar		4	0	4	62/	60/	61/
Muirkirk		3	0	3			
Portland	Egl'n'a	3	3	6			
Dalmellington		6	2	8	61/	60/	60/

EAST COAST BRANDS—*f. o. b. in the Forth.*

Kinneil		3	1	4	62/	59/	59 6
Almond		2	1	3	62/	59/	59/
Carron	Select'd	5	1	6	67/6	..	..
	Ordn'y				65/	..	..
Lochgelly		0	4	4	62/	59/	59/
Lumphinnans		0	2	2	..	..	..
Bridgeness		0	2	2	..	..	..

TRADES OF SHEFFIELD.

Another failure has occurred here since I last wrote, but it is not of a nature calculated to renew the feelings of mistrust which were somewhat abating; nor is it likely to lead to others, having itself been caused by the stoppage of the Phœnix Bessemer Steel Company. Mr. Thomas Hampton, who is the gentlemen alluded to, filed his petition on Monday in the Sheffield Bankruptcy Court, his liabilities being estimated at about £20,500. A good proportion of this amount is, I believe, owing on the 2500 shares the petitioner holds in the Phœnix Company, of which he was one of the original vendors, and, until recently, managing director. Mr. Hampton is well and widely known in the steel and iron trades, he having at one time carried on business at Maryport, Cumberland, in partnership with Messrs. W. A. Jackson and J. Fenton, as the Ellen Iron and Steel Company. Mr. Hampton, up to a few months back, when he met with a severe accident which has since incapacitated him from business, worked very hard to make the Phœnix Company a success, and there is a generally expressed opinion that had his health continued good, that consumation would have been attained.

It is possible, and even probable, that a few other failures may take place here within the next few weeks, but, as rumor has already pointed out those who are reputedly weakest, their financial downfall is being discounted, and ought not, therefore, to have any very bad effects on their business connections. The shareholders' meetings of John Brown & Co. and Charles Cammell & Co., held there last week, were productive of several interesting matters. In the course of the proceedings, Mr. Ellis, chairman of John Brown & Co., said there could be no question that the means of production had without doubt outstripped the requirements of the world generally. The spring trade was an instance of this. A few years ago there were only four or five houses in that trade at Sheffield, now there were eight or nine, and the number of customers had certainly declined by one-half. The result was that not half the spring machinery was in use, and orders were obtained at prices which left no profit whatever. In consequence of the old connection which John Brown & Co. enjoyed, considerable orders were obtained from its correspondents all over the world at a fair profit, but whenever they had to come into close competition with other houses it was absolutely impossible to secure orders at a profit. The wages of the workmen had been reduced during the year, but were even now much higher than on the Continent. He strongly condemned the nine hours' movement, for not only did they get but nine hours labor per day, but the machinery only did nine-tenths of its work. Mr. Pochin, a director, said the directors had begun the system of paying cash for every purchase, and they would not speedily depart from it. They had not a single acceptance running. He was happy to say that none of the failures which had taken place in the iron and coal trades had touched them. Mr. Stephen Burridge, the managing director, made some comparisons between their own and some foreign concerns, with such interest, that I think his figures are worth reproducing. He thought these balauce sheets clearly showed that goods were being sold under cost price. Without mentioning names he would say that the net profit of one concern in 1872 was £147,000, or 14 per cent. on the capital. In 1873 it was £133,000, and in 1874 only 1¼ per cent. was paid as dividend. In another concern, something like their own, the profit in 1873 was £46,000, but in 1874 only £3000. In another the figures were respectively £90,000, £42,000, and a loss of several thousand pounds this year.

At Messrs. Cammell & Co's meeting, allusion was made to the steel trade. It had made a very marked advance, but its present extent was nothing compared with the dimensions he (the chairman) predicted for it in future. They were destined to see steel used for purposes now hardly thought of, especially in shipbuilding. Mr. Brown, Leeds, also thought that a great future awaited the steel trade, and thought railway directors ought to use steel in place of iron much more extensively than they do.

Some descriptions of Bessemer pig irons of West country production have become slightly weaker during the past week or ten days, and are now quoted at figures which are materially lower than those last given. Milom Bessemer No. 1 is now 82/6; No. 2, 80/; and No. 3, 77/6. Ordinary No. 3 being 85/; No. 4, 84/; No. 5, 90/; mottled, 85; and white, 82/6, all on the terms so frequently mentioned in these columns. Maryport Hematite No. 3 is 82/6; No. 4, 82/6; M. and W., 81/; Bessemer No. 1, 85/; No. 2, 82/6; No. 3, 80/ per ton. A few of the coal owners have put down their quotations, but there is no really general drop, there being an evident intention to keep up prices this and next month, and then advance at the beginning or middle of September. The Sheffield Coal Company's new figures are: Picked branch coal, 13/6; best Birley Silkstone, 11/6; best picked Silkstone in cube form for the London market, 11/10; screened Silkstone nuts, 6/9; screened seconds, 8/; coke breeze, 10/; hard melting coke (washed) 18/; and unscreened slack, 3/ per ton of 21 cwts. at the pits. These quotations show reductions of 3d. to 9d. per ton.

In merchant irons very few sales are just now being effected, partly in consequence of the depression which has endured so long, and partly owing to the fact that owing to the drop notified in South Staffordshire on Thursday, a drop is expected to be declared here also. At present, common Yorkshire bars are selling at £8 to £8. 5/ per ton at the works, second quality bars at £9 to £10, and superior iron of the same class, such as the J. B. brand, at £12 to £12. 5/ per ton. Hoops are £11 to £11. 10/, and ordinary sheets £13 to £14. There is still a tolerably well sustained inquiry for good boiler and ship plates, a large proportion of the latter being consigned to the Humber, Clyde and Mersey yards. The Bessemer steel departments are by no means well engaged, the demand for steel rails being of a fitful, and, in many instances, unprofitable nature. A few lots of tires are being sent off, but of these articles, as well as springs, buffers and axles, the production has latterly been on an extremely limited scale. The armor plate mills and shops continue to be fully engaged on large plates, &c., for the British and various foreign governments. Not a few of the cast steel works are again but indifferently employed, the recent improvement in the number and size of orders not having been maintained. A limited number of the best houses are producing numerous small lots of tool and special sorts of steel, but the trade as a whole is anything but active, the American market being almost wholly unproductive of favors. In the file and saw trades no material change is noticeable. Edge tools are still selling in tolerable freedom, principally on account of Antipodean, South Africa, North European and French customers. In the cutlery branches no particular briskness is to be noted, although several firms are certainly doing more business than they were a month or so back. A few cutlery and file houses are stated to have been "hit" by one of the most recent London failures, but not for serious amounts. The stove grate manufacturers are busy, the recent revival in the building trades having had a tendency to fill up their order books.

The Board of Trade returns, alluded to in another part of this communication, may be taken as a tolerable certain indication of the state of the hardware industries during the past month.

THE NEW YORK BOARD OF TRADE

recently sent a letter to the Sheffield Chamber of Commerce asking for the co-operation of the latter in an effort to effect a revision of the United States' tariff. A circular accompanied the letter, and stated that the "agents and correspondents of British manufacturers had largely contributed to the baneful influence of the protectionists of America, who, although a minority, had succeeded in carrying their measures." To this the Sheffield Chamber of Commerce, on Saturday, sent the following reply:

"*Resolved*, That this council heartily sympathizes with the Board of Trade of New York in its endeavors to reform the present tariff on imported goods, and the condition of the customs department of the United States, and will gladly co-operate with the board in any practicable mode which may be open to this council. This council is unable to assent to the statement contained in Mr. Gwynn's circular, that 'the agents and correspondents of British manufacturers have largely contributed to the baneful influence of the protectionists in the United States.' If this be correct, the fact is greatly to be deplored, and the 'agents and correspondents' alluded to must have acted in a spirit entirely opposed to that which may now be said to prevail universally among commercial classes in Great Britain. But this council is not aware of any circumstances whatever leading to the conclusion that such statement is correct. That this council is strongly of opinion that the present tariff of the United States is not only most injurious to commerce and damaging to the American people, but is also the cause of the 'wholesale dealing in smuggled goods,' against which the New York board protests. That the remedies of these evils is so entirely within the limits of the national administration of the United States, that any active interference by British Chambers of Commerce is unadvisable, on grounds of international policy, and might probably do more harm than good. Nevertheless, the town and trade of Sheffield are deeply affected by the circumstances referred to by the New York Board. That a copy of the foregoing resolutions be forwarded to the New York Board of Trade."

TRADES MARK REGISTRATION.

A special meeting of the Sheffield manufacturers has been summoned for the purpose of considering the propositions of the government trades marks registration bill, which has already been read a third time in the House of Lords, and will shortly be before the Commons. A synopsis of the principal objects of the intended enactment, as affecting Sheffield, is as under: The bill proposes to establish a register of trade marks, and after the 1st of January, 1877, no proceedings are to be taken to prevent the infringement of trade marks until they are registered in pursuance of the act. By section 3 the registration of a mark by any person is *prima facie* evidence of his right to exclusive use thereof, and after five years conclusive evidence of such right. By section 7 the Lord Chancellor is to fix "the fee to be charged for registration, and also annually for the continuance of the trade mark on the register or otherwise." There is no saving of the rights of the Cutlers' Company, nor of the rights of the proprietors of established marks in respect of the right of registration of such marks. There are other provisions in the bill of importance, but the above are the principal ones which will interest Sheffield manufacturers.

BIRMINGHAM HARDWARE INDUSTRIES.

The iron trade proper has been mentioned with such sufficient amplitude in my opening remarks that it is unnecessary to refer to it here under the distinctive heading. The hardware manufacturers continue to be fairly well engaged in all directions. As I have previously stated, Messrs. Nettlefold have lowered the prices of their screws. I have now to add that other firms have followed suit. Many descriptions are reduced 20 per cent., among them American sleigh bolts and nuts, American tire bolts and nuts, the latter being at present quoted about 35½ to 40 per cent. off list. Wrought iron tea kettles are advanced 5 per cent., and range knobs are raised by 5 to 10 per cent., making the lowest price for these latter goods about 30/ per gross for 1½ inch, 50/ for 2 inch, and so on, according to size and quality.

TRADE OF SOUTH WALES.

The quarterly meeting of the tin plate manufacturers was held at Gloucester last week. A feeling of despondency prevailed, and there was considered to be no other way either of stimulating the demand or stiffening prices than by still further reducing the make. The inquiries were said to be very moderate, the large Liverpool buyers being disinclined to give the prices demanded by the producers. Common cokes are 26/, f. o. b., Liverpool, and charcoal 28/, same port. More activity is noticeable in the iron works. At Pontypool the Race Works, and the furnaces of Rhymney, Dowlais and Ebbw Vale are again in active operation. Cyfarthfa has a few mills going once more, so that there is still some hope. There is some talk of the Plymouth collieries and iron works being sold to different proprietors.

THE METAL MARKETS

have again been dull and quiet, with very little alteration in values. The Board of Trade returns show that the quantity of copper ore imported in the first six months of 1875 was 22,212 tons valued at £322,276, as against 23,559 tons worth £368,675 in the corresponding period of 1874. Of copper regulus 19,326 tons, worth £759,379, were brought in last half year, the figures for the same portion of 1874 being 12,754 tons, and £516,108 respectively. 197,430 cwts. of tin, worth £892,154, have been imported in the six months ending June 30, 1875, the totals up to same date of 1874 being 80,679 cwts., and £420,995.

Messrs. Von Dadelszen & North, say: There is no improvement in the tone of the metal market, which remains perfectly stagnant, while prices have in several instances slightly declined. The bank rate was reduced to 3 per cent. yesterday. *Iron.*—In South Wales business is at a standstill. In Staffordshire complaints are general. Marked bars have been reduced £1 officially, but this has had but little effect on the prices of other kinds. Scotch pig iron has varied but slightly, and closes at 60/ for month cash. The shipments last week were 14,101 tons, against 6112 tons for corresponding week 1874. *Copper* has been flat, and declined 20/ per ton on the receipt of the Valparaiso telegram giving charters for the last fourteen days of June as 4000 tons. Very little business

has been done, both buyers and sellers being loth to operate. A few small lots of g. o. b. Chili bars reported at £80. 10/. Wallaroo without business, nominally £90. 10/ f. o. b. Burra, £87. English rather easier. Tough, £88. India sheets done at £92. Yellow metal, 7½d. *Tin* much depressed, and, with small sales, has receded £2. 10/ per ton, the last sale of Straits being at £80, and Australian, £78. The Dutch market is flat. Banca, 50½fl.; Billiton, 48fl. The next sale of Banca will take place in Amsterdam on the 28th inst., and consist of 22,600 slabs. English nominally £86 for common; £88 to £89 for refined."

Messrs. Berger, Spence & Co.'s circular of to-day (12th), remarks: "At the Staffordshire meeting, which was unusually well attended, showing the keen interest felt by all concerned in its issue, the makers of all descriptions of iron promptly declared a reduction; yet, so far, this has had no perceptible effect in increasing the volume of business, probably owing to the fact that many manufacturers had already discounted old rates—thus taking from the reduction any momentary effect it might otherwise have had. In consequence of the exceedingly heavy charters advised for the last fortnight, copper has declined £1 per ton. Lead has been firmer toward the close of the week, but no alteration in value is to be noted."

Messrs. Warner, Walduck & Co.'s prices current is: "Railway chairs and bowl sleepers, £4. 5/; castings, £5. 15/, at works; "champion" bars, £10; hoops, £11; sheets, £12. 10; charcoal bars, £21; homogeneous sheets, £32, in London; bolts and nuts, £17. 10/; spikes and rivets, £12. 15/, in London; solid drawn steel tubes from 1/ per foot."

Messrs. Austin & Co.'s London rail circular gives these figures: "*Rails.*—American, 50 lb. to 60 lb. per yard, £6. 15/ to £7 per ton f. o. b. Wales; ditto, £7, East Coast. Russian and similar, 60 lb. to 75 lb., £6. 17/6 to £7. 2/6 f. o. b. Wales; ditto, £7 to £7. 5/, East Coast. Street rails, £7. 10/ to £8. 10/, Tyne and Tees; Steel rails, £9. 17/6 to £10. 2/6 f. o. b. Wales; ditto, £10. 5/ to £10. 15/, Liverpool or Hull."

Prospects of the Iron Trade.

We take the following from *Iron*:

It was, perhaps, hardly to be expected that the iron workers of Staffordshire and the North should submit, without protest, to further reductions of wages. To do them justice, they have, during the difficult period of transition, displayed a moderation which contrasts favorably with the occasional obstinate resistance of the mining population; and this temperate behavior has been the more praiseworthy on their part, as their generally conciliatory measures have often been brought to naught by the irreconcileable attitude of the miners. During the late declension of prices and consequent reduction of wages, the iron workers, who, as skilled workmen, take a higher rank than coal hewers, have accepted, as a rule, the chastening rod of lower wages with the philosophy worthy of skillful craftsmen, and have, over and over again, found themselves thrown out of work by the humbler but more determined auxiliaries who provide them with the fuel without which furnace and forge must alike stand idle. On these occasions public sympathy—whatever the precise value of that sentiment may be—has undoubtedly been with the workers in iron. During the last great struggle in South Wales, the melancholy spectacle was afforded of a large industrial army literally starved out by the inaction of their commissariat. The iron workers of Dowlais and Plymouth were ready and willing to work, but the "firm attitude" of the men of Rhondda and Aberdare subjected them indirectly to great privations. In like manner we have seen the iron workers of Staffordshire and of the North frequently interrupted by the fractiousness of the miners on whom they depend for iron stone and coal, and it is, therefore, with sincere regret that we see the most patient section of our iron producing population again subjected to a reduction of wages.

There is, however, only too much reason to regard the proposed lowering of the minimum rate as inevitable. Commercial misfortunes of almost unexampled gravity have revealed that the unheeded complaints of ironmasters concerning the unremunerative character of recent business have been only too well grounded on hard and inflexible facts. The record of iron and steel companies, conducted in some cases with abundant capital, has shown with menacing clearness that the period of inflation, during which a few persons made large fortunes and our working population established a claim to higher wages than they had previously enjoyed, has passed—at least for a time—and that the disagreeable process known as "coming down in the world" is indispensable as a condition of restoring the English iron trade to a healthy condition. It would be vain to deny that the exceptional prosperity enjoyed for a while by our English iron works has been one of the most potent engines in bringing about the present period of depression; and we think we are not going beyond our province in asserting that attempts to enhance price by the reduction of output have contributed not a little to produce the present uniform aspect of depression, although it is true that, with coal at a false price, our ironmasters who did not happen at the same time to be coalowners found themselves, as it were, between the upper millstone of declining prices and the nether one of high wages and dear coal.

Reduced prices have been brought about by a variety of causes, among the most potent and most irremediable of which is the decline in demand—not only for English iron, but for iron altogether. The story of the great commercial collapse in the United States, and of the less significant, but still sufficiently grave symptoms which have recently appeared on our own money market, points distinctly to the fact that the world had for a while "over-run the constable" in railway extension. Not only in the United States, but in other countries, had schemes been undertaken out of all proportion to the available capital for carrying them out, and the sudden check which fell like a blight upon these enterprises, has only been recently felt in its full force. For many very substantial reasons the public had become chary of investments in railways possessing no precise *raison d'etre*. The great French loan and other large national investments deflected capital from railways, and the houses which had undertaken to "finance" new lines found themselves incapable of placing the innumerable shares, preference shares and debentures with which they were overladen; but severe as was the awakening shock to purely financial speculators, it was as yet long in reaching the producers of iron, who, fortified by long contracts, preserved an appearance of prosperity long after the fructifying power of new schemes was practically dead. Concurrently with the cessation of new orders from America and other countries, came that foreign competition which—called into existence by English success and English high prices—arrived in the market far too late to reap any substantial share of profit. For a short period the civilized world went mad about coal and iron. High prices tempted into the field not only men and companies, but nations, who had, perhaps, better have confined themselves to industries for which they are better fitted by nature and better adapted by practice. Belgium, France and Germany addressed themselves seriously to the task of rivaling England, with results now patent to everybody. Belgian houses for a while struck terror into certain sections of our iron producers; but after extending their plant for the supposed new customer, now find themselves bereft of English orders. French iron masters complain bitterly of universal dullness, and the Germans, who altered their tariff to admit raw iron free, find themselves—owing to the increased consumption of Bessemer steel in the place of iron—entirely out of court, and completely unable to compete with our English makers. These severe experiences teach us once more that trade, like water, finds its level. Exceptional prosperity begets rivals, who, after bringing prices down to their level, are themselves demolished by the natural sinking of English values to something like their old rates. In like fashion, costly coal in England has produced an influx of capital and labor abundantly sufficient to reduce prices to nearly their former level, as has been found to their cost by the numerous companies formed during the period of famine prices, and which have just got into working order at the moment when they can only return the barest margin of profit. From these experiences, costly and painful as they may be, we can only gather that the prosperity of the English iron trade can be restored by one method alone—a gradual reduction to those prices which make enterprise possible. The enormous prices of a few years since have effectually killed off many branches of our export trade. Railway material once attained a figure which placed the cost of construction beyond the sphere of dividends, and the outlay necessary for a line of steamships equally crippled enterprise in that direction. Those facts are now patent, and it is equally clear that low prices alone will stimulate future demand. Under these circumstances we can only hope that no labor complications will arrest the tendency of prices toward that sound level which will enable us, with our immense natural advantages, to set competition at defiance. It is, of course, hard on our laboring population to be compelled to forego those minor luxuries to which they have recently become accustomed, but the wholesale ruin of many of their employers ought, at least, to teach our ironworkers that the capitalist has not always so much the better of the bargain as they were once led to suppose.

Belgian Competition with English Iron

The Sheffield *Telegraph* says:

The nature of the competition which South Staffordshire, as well as other English iron making districts, is experiencing, has just been brought prominently before the members of the South Staffordshire Mill and Forge Managers' Association, by Mr. W. Farnworth, manager of the iron and tin plate works of Messrs. E. P. & W. Baldwin. In a comprehensive and well arranged address laid before the members of the association, he has given "personal observations and statistics made and acquired during a journey through most of the principal coal fields and iron works in Belgium." He said that "the rails which an English iron master and himself inspected in the works of the John Cockerill Co., and which were going off in a finished state, were certainly such goods as would not have been passed in England. When he called the attention of the Belgian overseer to the flaws in the rails, the response was, "You would not have it quite sound, would you?" Nor was the unsoundness exceptional. They did not find one rail which would not, in England, have been called defective, or that would not need patching. The rails, however, were needed mostly for government lines, and the government had an interest in the works. Having noticed that the sheets with which the Belgians were rolling were both red-short and cold-short, he was not a little surprised when, on leaving the iron mills and going into the engine works, he found that locomotive dome casings were being made from Belgian sheet iron; when, however, he examined these casings, he found none perfect, and all had had to be patched. He knew well what kind of iron was required to stamp out a perfect dome, for he had been engaged in the making of it, and it had occupied much of his attention. He was not, therefore, surprised that, remembering the quality of the iron which the Belgians mostly produced, they should not, out of their own metal, be able to make perfect dome casings. Such domes would not be passed by English engineers. Whilst, therefore, the competition of Belgium in common qualities of iron was a serious matter, English masters had, in the superior quality of their products, much to be proud of. Nevertheless, it behoved the managers of the iron works in South Staffordshire to use unflaggingly all their skill, tact and energy to produce good iron at the cheapest possible rate. If this should be done, he had no fear either for mid England or the remoter iron making districts of this country. During the discussion which followed the reading of the paper, Mr. Farnworth said that the English people entertained very erroneous views as to the living of the Belgian iron worker. He could testify, after an inspection of the refectory arrangements at the leading iron works, that the Belgian iron worker lived as well and fared as abundantly as the best paid iron worker in England.

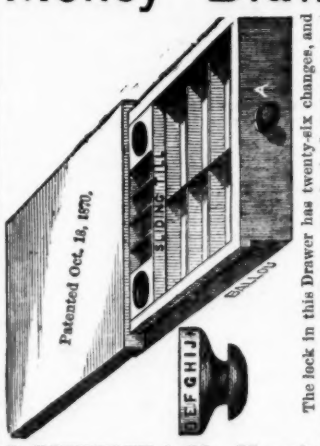
Lester Oil Company.

A company has been formed in this city for the extensive manufacture of the Patent Synovial Lubricating Oil. The oil in question, although new to the general public, has, nevertheless, been in constant use and subjected to the severest comparative tests by many of the leading manufacturers in the United States for years past, and as a result of such test and unqualified endorsement, and to meet the urgent demand for this lubricator, the present corporation, the Lester Oil Company, has been formed. We have seen some flattering testimonials from consumers of this oil regarding its lubricating qualities. The company claim that the saving effected by it is of such a positive character that it is bound to come into general use among manufacturers, railroads and steamship companies. The office of the company is at No. 183 Water street.

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The most Durable, Reliable & Economical Lubricant in existence;
Applicable to every grade of machinery. Send for Circular and Price List.

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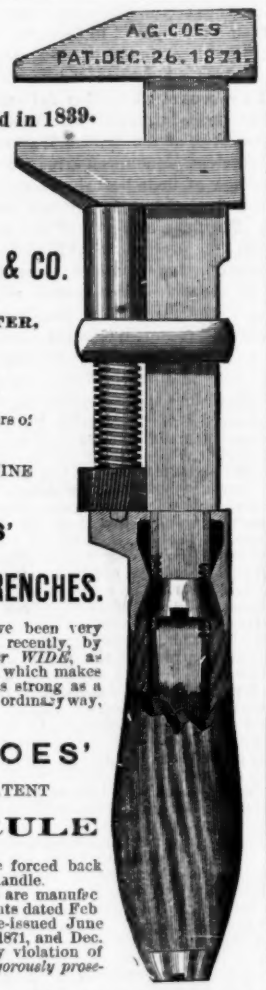
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Back Strap Shovels,
WITH
PATENT CORRUGATED STRAPS,
An improvement giving great strength to the weak point of ordinary shovels. The corrugation is from A to B on both sides, not sensibly increasing the size of handle.
Hardware buyer's attention is called to the fact that this improvement will command the market.
We are prepared to fill orders for Ames', Rowland's, and Myers & Armor's Scoops and Back Straps, with the patent Corrugated Straps, at 75 cents per doz., net, above *prices of regular goods*, shipping direct from the factories. Samples orders asked.


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Established in 1839.
A. G. COES & CO.
WORCESTER,
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Manufacturers of
THE GENUINE
COES'
SCREW WRENCHES.
Our goods have been very much improved recently, by making the *Bar WIDE*, as shown in the cut, which makes a ½ in. Wrench as strong as a 15 in. made in the ordinary way, and by using
A. G. COES'
NEW PATENT
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Which cannot be forced back into the handle.
☞Our goods are manufactured under Patents dated February 7, 1860, (re-issued June 29, 1871), May 2, 1871, and Dec. 26, 1871, and any violation of either will be *vigorously prosecuted*.
We call particular attention to our new Patent Ferrule, with its Supporting Nut (shown in section in the above cut), which makes the strongest Ferrule fastening known.
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No. 1, weight	16 lbs.,	cuts	⅜x2	inch, or	½	inch round or square	Price $25 00
No. 2, "	165	"	½x3	"	⅝	" "	" 50 00
No. 3, "	350	"	¾x4	"	1	" "	" 75 00

This is by far the most powerful Iron Cutter in use which can be worked by hand, having three times the capacity of any other machine which sells at the same price. The No. 3 machine occupies a space of 12x30 inches; when in use additional space must be had for the lever to work in. We send two sets of knives with each machine—one for square and flat, the other for round iron and steel. By using the knives adapted to it, round iron is cut without being flattened. One man can cut the largest size iron named above, but two would be required for steady work. It does not take a minute to change the knives or to shift the machine from large to small sizes.

AUGUSTA, GA., March 3, 1875.

MILLERS FALLS CO.—Enclosed find draft for amount of invoice, January 7. We would have sent the amount before, but did not have an opportunity of trying the Iron Cutter until a few days ago. It is one of the best machines we ever saw. Yours, truly, MOORE & Co.

Office of the ATHENS FOUNDRY AND MACHINE WORKS,
ATHENS, GA., February 18, 1875.

H. L. PRATT, President.—DEAR SIR: Enclosed find draft made payable to your order by Messrs. Childs, Nickerson & Co., in payment for Iron Cutter. We have put our Cutter to good service, and find it cuts readily 1¼ round, and 3½ x ⅝ square iron. C., N. & Co. are pleased with theirs, say it will save many a blow and cold chisel in their iron house.

Truly, yours, R. NICKERSON, Agent.

We make a satisfactory discount to dealers, and warrant the cutters to do all which we claim for them. Send for prices.

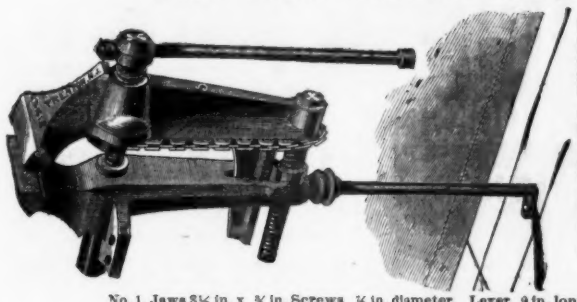
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TUBE SCRAPERS, FAMILY TOOL CHESTS,
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The New Double Screw Parallel "Leg" Vise.



We are now ready to furnish, as the result of more than thirty years' experience, our latest style of Vise—the best yet made. It is **stronger** than any other, whether of Foreign or of American make; always parallel and holding with a tighter "grip." The jaws are of convenient shape for the workman to get near his work equally well for filing or chipping, instead of the heavy, clumsily formed jaws of the cast iron Single Screw Vises of the common "parallel" type, and which, depending upon slides alone for preserving parallelism, can never be screwed up very hard without "jamming" on the slides or breaking.

Our New Vise combines all the advantages of the "Peter Wright" Leg Vise, of strength and lightness, fastening to the floor and bench, and at the same time greatly superior to it; is always perfectly parallel at all points of opening, and never gets out of line. Embodying the same general principle as the well known Chain Vise, so long made by us, we have by new, scientific proportioning of all the parts, and with our recently improved metals for their manufacture, obtained so perfect a tool, that we now *warrant* these Vises for *three years* from date of manufacture stamped upon each.

The Jaws are of best Tool Cast Steel, welded on, file cut and properly hardened. The screws are forged of the best refined iron, and work in *solid cut thread* boxes.

The lower screw maintains the parallel position of the two jaws, by having exact motion with the upper working screw through the connecting chain which regulates it.

The chain is very accurately made of steeled links and rivets, and having no strain of the work upon it, is therefore as durable as all the other parts.

Prices with Special Discounts to the Trade.

No. 1,	Jaws 3½ in. x	¾ in.	Screws	⅝ in.	diameter.	Lever 9 in. long,	Opens 4¼ in. $8 00
" 2,	" 4½ in. x 1	in.	"	1⅛ in.	"	" 13 in. "	" 5¾ in. 12 00
" 3,	" 5¼ in. x 1⅜	in.	"	1¼ in.	"	" 16 in. "	" 6½ in. 17 00
" 4,	" 6¼ in. x 1⅝	in.	"	1⅜ in.	"	" 19 in. "	" 7⅛ in. 22 00
" 5,	" 7 in. x 1⅝	in.	"	1⅝ in.	"	" 24 in. "	" 9 in. 30 00
" 6,	" 8 in. x 1⅝	in.	"	1⅝ in.	"	" 28 in. "	" 10 in. 34 00

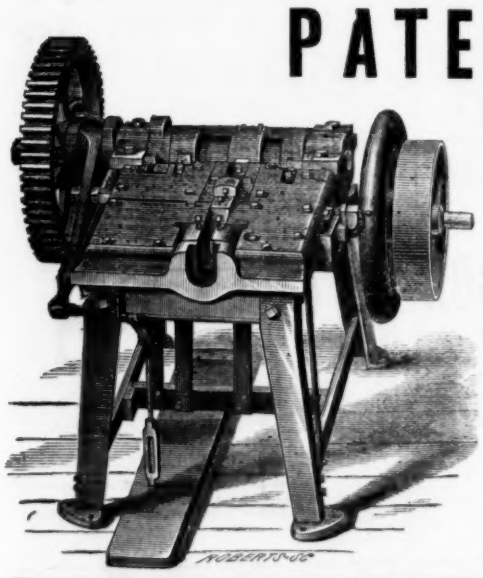
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Three sizes of these machines are made, viz:

No. 1 will make bolts from	½	inch down.	
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The three sizes if run together would require from 2 to 2½ horse-power.

The variety of shapes that can be made are only limited by the ingenuity of the owner. A few minutes only are required to make a change from one shape or size to another. All dies are made of the best Cast Steel, and can be redressed many times.

T, Button, Countersunk, Rivet and Round Head; Plow and Track Bolts, &c., are made at one revolution. Square and Hexagon Heads require from 3 to 5 revolutions.

For Simplicity, Durability and Compactness it has no equal.

A Boy can learn to run it in a few hours. The bolt is made on the heated bar and cut off in the machine to any length from 1 to 10 inches; if greater lengths are desired, they should be cut before heating. Either Round or Square Iron may be used.

Will use up as much iron as can be heated in any ordinary blast fire.

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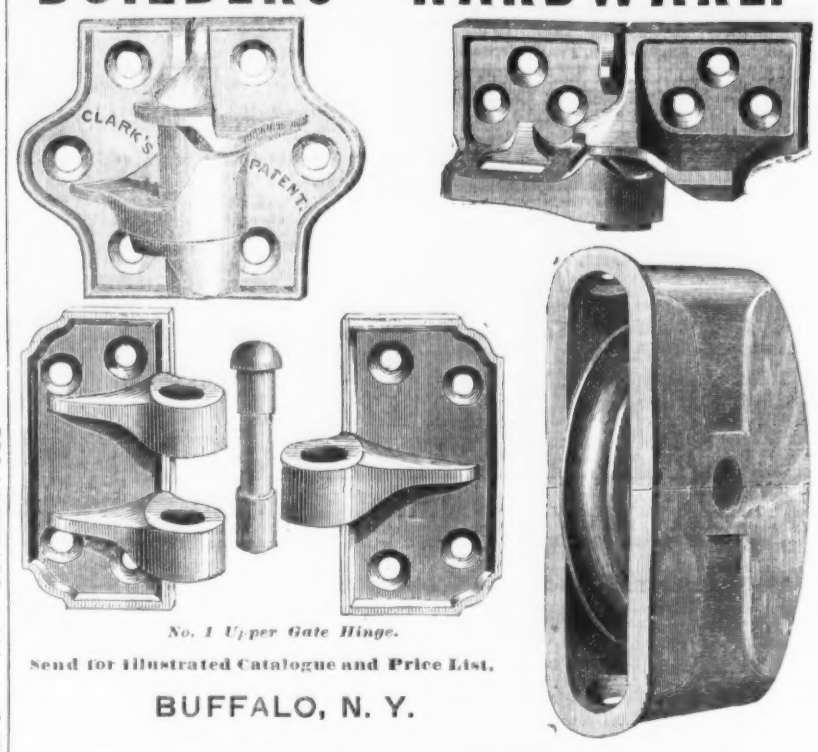
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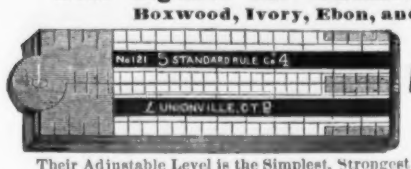
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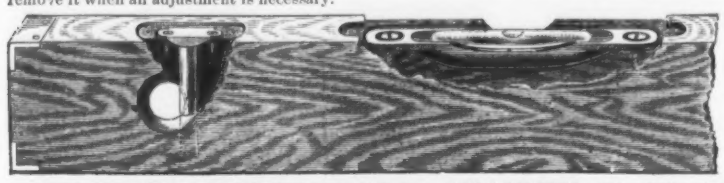
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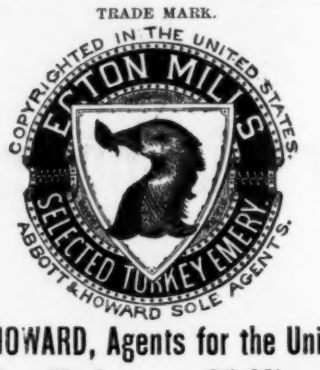
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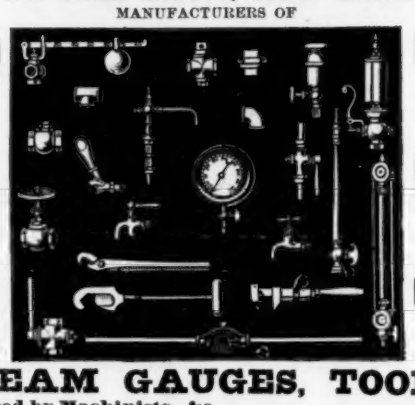
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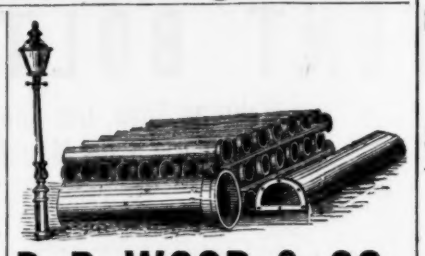
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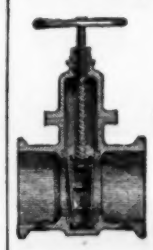
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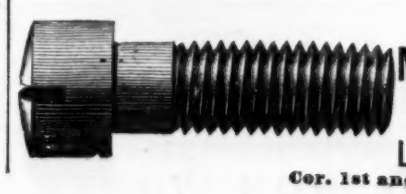
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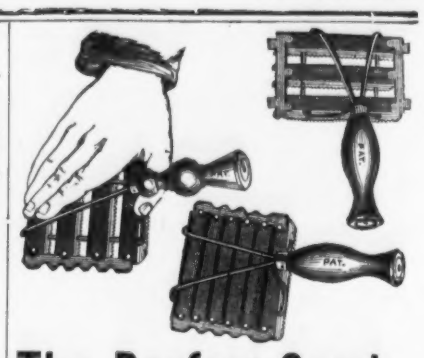


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Garrison A. & Co. Pittsburgh, Pa. 4
Galvanized Iron.
Lefferts Marshall Jr., 90 Beekman, N. Y. 4
Gas Fixtures. *Makers of.*
Bradley & Hubbard Mfg. Co., 21 & 23 Barclay, N. Y. 40
Glass. *Importers of.*
Downing A. C. & Co., 57 Beekman, N. Y. 31
Governors.
Hartford Governor Co., Hartford, Ct. 38
Junius Judson & Son, Rochester, N. Y. 38
Shive Governer Co., Bethlehem, Pa. 38
Grindstones.
Wood Walter R., 283 and 285 Front, N. Y. 32
Worthington & Sons, North Amherst, O. 32
Guns &c
Schoverling & Daly, 84 Chamber St. 25
Tryon Edw. K., Jr., & Co., 19 N. Sixth, Philadelphia. 13
Windmuller Louis & Roelker, 20 Reade N. Y. 20
Gunpowder. *Makers of.*
Kneeland F. L. (Dupont) 70 Wall, N. Y. 36
Lafin & Rand Powder Co. 21 Park Row, N. Y. 36
Hammers, etc., *Manufacturers of.*
Emmet Hammer Co., Brooklyn, E. D., N. Y. 13
Hammond R., Hartford, Ct. 8
Handles. *Makers of*
N. Carolina Handle Co., 79 Reade, N. Y. 10
New York Mallet and Handle Works, 456 E. Houston, N. Y. 17
Greensboro' Handle Works, 103 Chambers, N. Y. 6
Hardware Commission Merchants.
Dodge William A., 96 Chambers, N. Y. 17
Graham & Haines, 8c Chambers, N. Y. 34
Heaton & Denckla, Phila. and N. Y. 6
Peck G. Webster, 110 Chambers, N. Y. 8
Walbridge G. B. & Co. 99 Chambers, N. Y. 31
Walsh, Coulter & Flagler, 83 Chambers, N. Y. 8
Wilson J. Clark & Co., 81 Beekman N. Y. 10
Hardware Dealers.
Brower John I. & Son, 288 Greenwich, N. Y. 8
Lloyd, Supplee & Walton, 625 Market, Phila. 10
Quackenbush, Townsend & Co., 59 Reade, N. Y. 34
Shepard Sidney & Co., Buffalo N. Y. 31
Wilson J. Clark & Co., 81 Beekman, N. Y. 10
Hardware Importers.
Boker Hermann & Co., 101 Duane, N. Y. 33
Field Alfred & Co. 93 Chambers, N. Y. 33
King, Briggs & Co., 80 Chambers, N. Y. 10
Van Wart & McCoy, 134 and 136 Duane, N. Y. 10
Turnor R. A., 78 Chambers, N. Y. 11
Windmuller Louis & Roelker 20 Reade N. Y. 20
Hardware Manufacturers.
American Spiral Spring Butt Co., 82 Beekman, N. Y. 40
Buffalo Hardware Co., Buffalo, N. Y. 3
Enterprise Mfg. Co., Phila. 34
Hart, Bliven & Mead Mfg. Co., 243 Pearl N. Y. 34
Middletown Tool Co., 18 & 20 Cliff, N. Y. 6
Miller's Falls Mfg. Co., 78 Beekman, N. Y. 25
Pratt & Co., Buffalo, N. Y. 31
Providence Tool Co., Providence, R. I. 13
Schweitzer Mfg. Co. 57 Reade, N. Y. 4
The Hull & Belden Co., Danbury, Conn. 4
Phelan Edward, 113 Chambers, N. Y. 19
Union Mfg. Co. 99 Chambers, N. Y. 7
Van Wagoner & Williams, 82 Beekman, N. Y. 40
Williams, White & Churchill, 73 Warren, N. Y. 26
Wilson Mfg. Co., 37 Chambers, N. Y. 12
Hardware Specialties.
Bevington & Northup, Rochelle, Ills. 11
Eagle Mfg. Co., New N. J., and 62 Duane, N. Y. 13
Post C. C., Burlington, Vt. 7
Shepard Sidney & Co., Buffalo, N. Y. 31
Hay Knives, *Makers of.*
Holt, Hiram & Co., East Wilton, Franklin Co., Me. 18
Hoes. *Maker of.*
Rogers H. C., Jordan, N. Y. 10
Hicks O. H. & Co., Baltimore, Md. 6
Hoisting Engines. *Makers of.*
Crane Bros. Mfg. Co., Chicago, Ill. 9
Otis Bros. & Co., 348 Broadway, N. Y. 9
Horse Hay Forks and Fixtures, *Makers of.*
Nellis A. J. & Co., Pittsburgh, Pa. 40
Horse Nails, *Makers of.*
Ausable Horse Nail Co., 35 Chambers, N. Y. 38
Globe Nail Co., Boston, Mass. 33
Pratt & Co., Buffalo, N. Y. 31
Putnam S. S. & Co., Neponset, Mass. 27
Horse Shoes, *Makers of.*
Burden Iron Works, Troy, N. Y. 4
Rhode Island Horse Shoe Co., Providence, R. I., ... 9
Schoenberger & Co., Pittsburgh, Pa. 4
Semple, Birge & Co., St. Louis 34
Hydraulic Jacks.
Dudgeon Richard, 24 Columbia, N. Y. 33
Ice Tools.
Carter W. H., 100 Chambers, N. Y. 18
Insurance, Boiler.
Hartford Steam Boiler Inspection and Insurance Co. 39
Iron Brokers.
Boynton Geo. A., 70 Wall, N. Y. 4
Coleman & Bro., Louisville, Ky. 4
Crane U. O., 104 John, N. Y. 4
Hatry A. G., Pittsburgh, Pa. 4
Hazard T. D. 204 Pearl, N. Y. 4
Iron Bridges.
Leighton Bridge and Iron Works, Rochester, N. Y. 18
Iron, Charcoal, *Warm or Cold Blast,*
Quincy John, 96 William, N. Y. 4
Iron Commission Merchants.
Justice Cox Jr. & Co., 333 Walnut, Phila. 5
Hand Jas. C. & Co., 614 and 616 Market, Phila. 6
Hoopes W. Graham, 419 Walnut, Phila. 6
Malin Bros., 228 Dock, Phila. 5
Spooner & Collins, St. Louis, Mo. 5
Iron, Pig, *Importers of.*
Williamson James & Co., 69 Wall, N. Y. 4
Iron Pig, *Manufacturers of*
Parrott Peter P., Greenwood Fce., Orange co., N. Y. 4
Iron Dealers.
Abeel Brothers, 190 South, N. Y. 4
Bonnell, Botsford & Co., Youngstown, O. 6
Borden & Lovell, 70 and 71 West, N. Y. 4
Cleveland, Brown & Co., Cleveland, O. 6
Coddington T. B. & Co., 25 Cliff, N. Y. 4
Cooney Daniel F., 68 Washington, N. Y. 4
Ruerstel G., 99 Market Slip, N. Y. 4
Fuller, Lord & Co., 139 Greenwich, N. Y. 4
Fuller, Dana & Fitz, 110 North, Boston. 2
Gardner Wm., 575 Grand, N. Y. 4
Harrison & Gillioon, 558 to 562 Water, N. Y. 4
Holden, Hopkins & Stokes, 104 John, N. Y. 4
Jackson & Chase, 206 and 208 Franklin, N. Y. 4
Judson B. F., 457 and 459 Water, N. Y. 4
Matthews Chas. W., 133 Walnut Phila. 5
Ogden Wallace, 85, 87, 89 and 91 Elm, N. Y. 4
Packard, Goff & Co., Youngstown, O. 4
Pettee & Mann, 228 and 229 South, N. Y. 4
Pierson & Co., 24 Broadway, N. Y. 4
Quincy John W., 96 William, N. Y. 4
Reed John H. & Co. 4
Richards D. W. & Co., 92 Mangin St., N. Y. 4
Richardson J. O., 329 Walnut, Philadelphia. 5
Snyder Asa, Richmond, Va. 4
Wallace Wm. H. & Co., Albany and Washington streets, N. Y. 4
Warner A. B. & Sons, 28 and 29 West, N. Y. 4
Williamson James & Co., 69 Wall, N. Y. 4
Whitney A. R. & Co., 58 Hudson N. Y. 4
Iron, *Manufacturers of.*
Britannia Iron Works, Middlesbro', Eng. 6
Burden Iron Works, Troy, N. Y. 4
Cleveland Rolling Mill Co., Cleveland, O. 6
Coffin Wm. E. & Co., 8 Oliver, Boston. 4
Boston Rolling Mills, 17 Batterymarch, Boston. 4
Everson, Macrum & Co., Pittsburgh, Pa. 4
J. & J. Rogers Iron Co., Ausable Forks, N. Y. 5
Lackawanna Iron and Coal Co., Scranton, Pa. 5
Leonard John, 450 & 451 West st., N. Y. 4
Milwaukee Iron Co., Milwaukee, Wis. 6
Naylor & Co., 6 Oliver, Boston. 4
Old Dominion Iron & Nail Works Co., Richmond, Va. 6
Oxford Iron Co., 81 Washington, N. Y. 4
Phœnix Iron Co., 410 Walnut, Phila. 5
Rowland Wm. & Harvey, Phila. 40
Snoenberger & Co., Pittsburgh, Pa. 4
Taylor, Mitchell & Pond, Massillon, O. 4
Iron, Swedish, *Importers of.*
Jessop Wm. & Sons, 91 and 93 John, N. Y. 26
Mitander Nils, 69 William, N. Y. 4
Keys and Cutters, *Manufacturers of.*
Barnes Geo. & Co., Syracuse, N. Y. 26
Knitting Machines, Upright Rotary, *Makers of.*
Clark Tompkins, Troy, N. Y. 31
Lace Leather, *Manufacturers of.*
Fales Geo. S., Pawtucket, R. I. 26
Lanterns. *Manufacturers of.*
Dietz R. E., (Tubular) 54 and 56 Fulton, N. Y. 40
Howard & Morse, 45 Fulton, N. Y. 2
Lead Pipe, &c., *Manufacturers of.*
Mayley, Farrell & Co., Pittsburgh, Pa. 2
Locks. *Manufacturers of*
American Lock Mfg. Co., Cazenovia, N. Y. 9
Bohannan Wilson, Broadway and Kossuth, Brooklyn, E. D. 11
D. K. Miller Lock Co., 712 Cherry, Philadelphia. 40
Romer & Co., Newark, N. J. 11
Tower John J., 98 Chambers, N. Y. 34
Union Nut Co., 78 Beekman, N. Y. 26
Yale Lock Mfg. Co., 298 Broadway, N. Y. 10
Lubricators. (Patent) *Maker of.*
Crosley H., Brooklyn, N. Y. 33
Machinery. *Makers of.*
Forsaith S. C. & Co., Manchester, N. H. 38
Pratt & Whitney Co., Hartford, Conn. 38
Sellers Wm. & Co., 1600 Hamilton Phila. 39
The Hull & Belden Co., Danbury, Conn. 4
Wetherill Robert & Co., Chester, Pa. 38
Whittier Machine Co., 1176 Tremont, Boston, Mass. 38
Wood Taomas, 2106 Wood, Phila. 39
Machine Screws, *Makers of.*
American Screw Co., Providence, R. I. 13
Lyon & Fellows Mfg. Co., Williamsburg, N. Y. 26
Reynolds & Co., New Haven, Conn. 4
Rochester Machine Screw Co., Rochester, N. Y. 13
Machinists' Tools, *Makers of.*
Blaisdell P. & Co., Worcester Mass. 39
Harrington Edwin & Son, 18th st. and Pa. ave., Phila. 39
Jones, Lamson & Co., Windsor, Vt. 39
Le Count C. W., South Norwalk, Conn. 10
New Haven Mfg. Co., New Haven, Ct. 39
Van Haagen C. & Co., Phila., Pa. 32
Machinery and Tools, *Importers of.*
Graham Bros., 122 Cannon street, London, E. C. 36
Malleable Articles. *Maker of.*
Hammer & Co., Branford, Ct. 14
Manganese.
Hobbs, Pope & Co., 35 India st., Boston. 2
Measuring Tapes.
Eddy Geo. & Co., 358 Classon Ave., Brooklyn, N. Y. 33
Metal Dealers and Brokers.
Coddington T. B. & Co., 25 and 27 Cliff, N. Y. 4
Coit Edward W., 205½ Walnut, Phila. 4
Cort N. L. & Co., 220 & 222 Water, N. Y. 2
Crane U. O., 104 John, N. Y. 4
Crocker Bros., 32 Cliff, N. Y. 9
Gregg H. L. Co., 108 Walnut, Phila. 5
Lefferts J. C., 241 Pearl, N. Y. 4
W. J. Hammond, Pittsburgh, Pa. 2
Phelps, Dodge & Co., Cliff, bet. John & Fulton, N. Y. 2
Purves A. & Son, cor. South and Penn, Phila. 20
Quincy J. W., 96 William, N. Y. 2
Sturges Frank & Co., 72, 74 & 76 Lake, Chicago. 17
Thomson A. A. & Co., 213 and 215 Water, N. Y. 2
Van Wart & McCoy, 134 and 136 Duane N. Y. 2
Metaline.
American Metaline Co., 61 Warren. 10
Metallurgists.
Britton J. Blodgett, 320 Walnut, Phila. 6
Maynard & Van Rensselaer, 261½ Broadway, N. Y. 6
School of Mines, E. 49th, N. Y. 6
Meat Chopping Machinery.
Murray Iron Works, Burlington, Iowa. 18
Mining Spikes
Roseberry Geo. D., Pottsville, Pa. 4
Miner's Candles, *Makers of.*
James Boyd's Sons, 12 Franklin N. Y. 31
Molders' Tools.
Carter H., 200 Pearl, N. Y. 10
Mop Heads. *Manufacturers of.*
Buffalo Hardware Co., Buffalo N. Y. 3
Mouse Traps, Catchemalive, *Makers of.*
Dietz R. E., 54 and 56 Fulton, N. Y. 40
Nails.
Schoenberger & Co., Pittsburgh, Pa. 4
Nail Machinery.
Gugisperg D., 84 Ave. B., N. Y. 38
Nail Pullers.
Maltby, Curtiss & Co., 34 Reade, N. Y. 17
Nickel Platers.
Harris & Weston, 182 Centre, N. Y. 2
Hartman John, 1042 Ridge avenue, Philadelphia. 2
New York Nickel Plating Co. 133 West 25th, N. Y. 2
Norway Shapes, *Rollers of.*
Rowland Wm. & Harvey, Frankford, Phila. 40
Note Broker.
Gallaudet F. W., 3 and 5 Wall, N. Y. 4
Nuts, Bolts, etc., *Makers of.*
American Bolt Co., 210 Lawrence, Lowell, Mass. 13
Carpenter David, 402 Water N. Y. 4
Clark Bros. & Co., Millidale, Conn. 12
Fuller, Lord & Co., 139 Greenwich, N. Y. 4
Haskell W. H. & Co., Pawtucket, R. I. 13
Hoopes & Townsend, 1230 Buttonwood, Phila. 12
Lewis, Oliver & Phillips, Pittsburgh, Pa. 13
New Haven Nut Co., Westville, Ct. 28
Old Colony Rivet Works, 116 Chambers, N. Y. 13
Rosebrugh George, Pottsville, Pa. 4
Russell, Birdsall & Ward, Port Chester, N. Y. 40
Plumb, Burdict & Barnard, Buffalo, N. Y. 40
Shelton Co., Birmingham, Conn. 34
Sternbergen J. H., Reading, Pa. 13
Union Nut Co., 78 Beekman N. Y. 26
Oil Lubricating, *Makers of*
Lester Oil Co., 183 Water, N. Y. 34
Oil Stones, *Makers of.*
Boyd & Chase, 107th street and 1st avenue, N. Y. 32
Old Iron, etc.
Gregg H. L. & Co., 108 Walnut, Philadelphia. 5
Ore Crushers.
Blake Crusher Co., New Haven, Ct. 38
Packing for Engines, &c., *Manufacturers of.*
Glanding Jas. & Co., 115 Queen, Philadelphia. 30
Paints and Oils, *Dealers in.*
Devoe F. W. & Co., 117 Fulton, N. Y. 4
Empire Iron Clad Paint Co., 20 West B'way, N. Y. 32
Patent Soliciters.
A. V. Briesen, 258 Broadway, N. Y. 20
Burke & Fraser, 37 Park Row, N. Y. 28
Cox & Cox, 229 Broadway, N. Y. 28
Howson & Son, Phila. and Washington, D. C. 28
Munn & Co., *Scientific American* 37 Park Row N. Y. 33
Stetson T. D., 23 Murray, N. Y. 26
Picture Nails, etc., *Manufacturers of.*
Richards T. C. & Co., 47 Murray, N. Y. 3
Pipes, Fittings, etc., *Makers of.*
Eaton, Cole & Burnham Co., 58 John, N. Y. 26
Magens & Co., Louisville, Ky. 32
Meyer Henry C. & Co., 48 Cliff, N. Y. 40
McNab & Harlin Mfg. Co., 56 John, N. Y. 26
Nelson, Finkel & Co., 439 E. 10th st., N. Y. 26
Pacoast & Maule, 227 Pear, Phila. 26
Pipe Threaders, Cutter &c.,
Converse, M. D., 68 Park Place, N. Y. 33
Empire Mfg. Co., 18 William, N. Y. 33
Pipe, Water and Gas, *Makers of.*
Leighton Bridge and Iron Works, Rochester, N. Y. 18
McNeal John & Sons, Burlington, N. J. 6
National Tube Works Co., 78 William, N. Y. 26
Warren Foundry & Mach. Co., Phillipsburg, N. J. 26
Wood R. D. & Co., 173 Broadway, N. Y. 26
Piston Packing.
Canfield John & Co., 1221 Fairmount Ave., Phila. 19
Plane Irons, *Manufacturer of*
Buck Bros., Millbury, Mass. 34
Mack & Co., Rochester, N. Y. 25
Middletown Tool Co., 18 & 20 Cliff, N. Y. 6
Planes, *Manufacturers of.*
Greenfield Tool Co., Greenfield, Mass. 34
Mack & Co., Rochester, N. Y. 25
Stanley Rule & Level Co., 35 Chambers, N. Y. 26
Plated Ware
Derby Silver Co., Derby, Ct. 40
Reed & Barton, 2 Maiden Lane, N. Y. 33
Plows, Chilled Iron. *Makers of.*
South Bend Iron Works, South Bend, Ind. 25
Plumbago Lubricator.
Joseph Dixon Crucible Co., Jersey City, N. J. 40
Plumbers' Materials, *Manufacturers of*
Everhart Jas. M., Scranton, Pa. 40
Carr Wm. S. & Co., 106 Centre, N. Y. 36
Power Hammers, *Makers of.*
Forsaith S. C. & Co., Manchester, N. H. 35
Presses, Power, *Makers of.*
Boomer & Boschert Press Co., Syracuse, N. Y., and 26 Beekman, N. Y. 39
The Stiles & Parker Press Co., Middletown, Ct. 33
Pressure Blowers. *Makers of.*
Sturtevant B. F., 72 Sudbury, Boston. 32
Wilbraham T. & Bros., 2316 Frankfort Ave., Phila. 39
Pumps, *Makers of.*
Clayton Jas., Brooklyn, N. Y. 7
Douglas W. & B., Middletown Conn. 7
Union Mfg. Co., 99 Chambers, N. Y. 7
Valley Mch. Co., Easthampton, Mass. 7
Pyrometers.
Brown Edward, 311 Walnut, Phila. 4
Railroad Supplies.
American Steel Frog Co., Harrisburg, Pa. 25
Duyckinck W. G., 50 and 52 John, N. Y. 8
Jackson & Tyler, Baltimore, Md. 28
Potter, Hoffman & Co., 110 Liberty N. Y. 6
Rails, *Importers of.*
Congreve Chas. & Son, 104 and 106 John, N. Y. 37
Rails, Iron or Steel, *Makers of.*
Atkins Bros., Pottsville, Pa. 6
Cambria Iron Co., Johnstown, Pa. 5
Cleveland Rolling Mill Co., Cleveland, O. 6
Griswold John A. & Co., Troy, N. Y. 36
Lackawanna Iron and Coal Co., Scranton, Pa. 5
Milwaukee Iron Co., Milwaukee, Wis. 6
Railway Track Tools.
American Steel Frog Co., Harrisburg, Pa. 25
Metcalf, Paul & Co., Pittsburgh, Pa. 33
Razor Straps, *Makers of.*
B. F. Badger, Charlestown, Mass. 26
Refrigerators. *Makers of*
Lesley Alex. M., 236 W. 23d st., N. Y. 17
Revolvers.
Tryon E. K., Jr., & Co., 229 N. 3d, Philadelphia. 25
Rivets.
Old Colony Rivet Works 34 Warren, N. Y. 12
Timmes Peter, 281 North 6th, Brooklyn, E. D. 4
Road Scrapers, &c., *Makers of.*
Revolving Scraper Co., Columbus, O. 19
Rolling Mill Machinery, etc., *Manufacturers of.*
Birmingham Iron Foundry, Birmingham, Ct. 4
Moore James, Cor 16th and Buttonwood, Phila. 35
Rules, *Manufacturers of.*
Stanley Rule and Level Co., 35 Chambers St. 26
Stephens & Co., Riverton, Ct. 3
Saddlery Hardware, *Makers of*
Sargeant Mfg. Co., Newark, N. J

Volatility of Oxide of Zinc.

The fact that more or less zinc is lost by roasting blends, induced Prof. Stahlschmidt to make a series of experiments to determine the temperatures at which zinc oxide volatilizes. They were as follows:

1. Zinc oxide was heated to a lively red heat in a porcelain crucible over a Berzelius gas lamp. The temperature was so high that hard glass was softened, carbonate of soda fused and so did antimony; the temperature could not have been less than 1300° F. to 1470° F. Not a trace of the oxide had been volatized

2. Zinc oxide was exposed to a bright red heat in a porcelain crucible for half an hour. A portion of it had flown away, another portion was deposited on and under the lid of the crucible, that is on a cooler spot. There had been volatilized, exclusive of the deposited portion, 55·21 per cent. of the whole.

3. The zinc oxide was exposed to the highest temperature attainable, almost a white heat. At the end of half an hour 96·90 per cent. had been volatilized. This shows that at a bright red heat (that of a gas-retort furnace), and at higher temperatures, oxide of zinc is highly volatile. The oxide can be partially or wholly condensed on cooler places, especially when the draft is not strong.

4. Zinc oxide was exposed to the same high temperature as before, air being passed over it. In half an hour 59·30 per cent. had been volatilized. This experiment was made as a precaution to be sure that the oxide was not reduced by the gases of blast and volatilized as metallic zinc. The experiment proves that the zinc oxide was volatilized as such.

5. Zinc oxide was heated over a blast lamp to a good red heat. At that temperature silver did not melt, so it must be between 1500° and 1800° F. It was, at all events, higher than in No. 1; in one-half hour not a trace of the oxide had been volatilized.

6. The temperature was raised; silver just began to melt and solidified at once by momentary cooling; the temperature was about 1800° F. In 1½ hours 5·23 per cent. zinc was volatilized.

7. The temperature was raised until copper began to melt, say 2300° F. In half an hour 40·3 per cent. oxide of zinc was perfectly volatilized. Some of the oxide of zinc not included in the 40·3 per cent. had sublimed on the higher and cooler part of the crucible.

As a whole, the experiments show that at temperatures about red heat, but below the melting point of silver, oxide of zinc is not volatile. At temperatures where silver softens, or just melts, the oxide of zinc volatilizes slowly, rapidly at the melting point of copper, and very rapidly at temperatures about bright red or white.

Finely pulverized, transparent yellow Spanish blende was roasted at a red heat as long as sulphurous acid was given off, and the following experiments made with the roasted blend instead of oxide of zinc:

1. It was exposed for 30 minutes to a temperature just below the melting point of silver. None of it was volatilized.

2. The temperature was raised until silver just melted. In 30 minutes no zinc oxide was driven off.

3. At a temperature where silver was a thin fluid, it was not volatilized.

4. The temperature was raised again until copper just melted. In 30 minutes 15·54 per cent. oxide of zinc was volatilized beside the sublimate on the crucible.

From this it appears that oxide of zinc formed by roasting, the sulphide differs in volatility from pure oxide, the sublimation temperature of the former being 180° to 360° F. higher than that of the latter.

From this it will be seen that excessive heat in the roasting furnace for blend is injurious and wasteful.

Report of Inspections made by the Hartford Steam Boiler Inspection and Insurance Co. for the months of February, March, April and May, 1875.—During the four months ending June 1, 1875, 4710 visits of inspection were made, and 9688 boilers inspected—8700 externally, and 2770 internally; while the hydraulic pressure was applied in 656 instances. These examinations developed defects and weaknesses numbering 4930—of which 1557 were regarded as dangerous. Steam boilers are often used in a very dangerous condition. Plates may be corroded to the thinness of paper, fractures along the line of rivets may be growing more and more dangerous, braces and stays may be broken or loose, and the steam user be entirely ignorant of these defects, unless careful and thorough periodical inspections are made. Boilers that appear to be perfectly sound often explode, and some weakness is discovered which was, without doubt, the cause of the accident. Then follow theories of suspension, electricity, repulsion, &c., when the plain cause is—a boiler too weak to withstand the pressure. The following defects, found in four months' time, will give some impression of the condition in which boilers in daily use are frequently found: Furnaces out of shape, 212—48 dangerous. Fractures, 449—250 dangerous. Burned plates, 327—139 dangerous. Blistered plates, 825—197 dangerous. Sediment and deposit, 646—of these cases, 81 were so bad that the boilers were regarded as in a dangerous condition. Incrustation and scale, 757—132 dangerous. External corrosion, 364—153 dangerous. Internal corrosion, 134—58 dangerous. Internal grooving, 47—19 dangerous. Water gauges defective, 212—64 dangerous. Blow out defective, 76—33 dangerous. Safety valves overloaded, 150—72 dangerous. Pressure gauges defective, 662—163 dangerous. The gauges varied from the standard from −40 to + 30. These were the extreme variations, but in many instances the variations were from −10 to + 10. This shows how important it is to have all the boiler attachments, as well as the boiler itself, often examined. Boilers without gauges, 175—5 dangerous. Deficiency of water, 57—32 dangerous. Braces and stays in broken and unsafe condition, 212—98 dangerous. Boilers condemned, 81.



Stafford Manufacturing Co.'s

STENCIL COMBINATIONS.

Containing: Stencil Alphabet, Figures, Can Stencil Ink and Brush.

For marking boxes, barrels, bags, and packages for shipment. Printing all manner of show cards, notices, signs, numbers, prices, &c., and other purposes too numerous to mention. Instructive and amusing for boys.

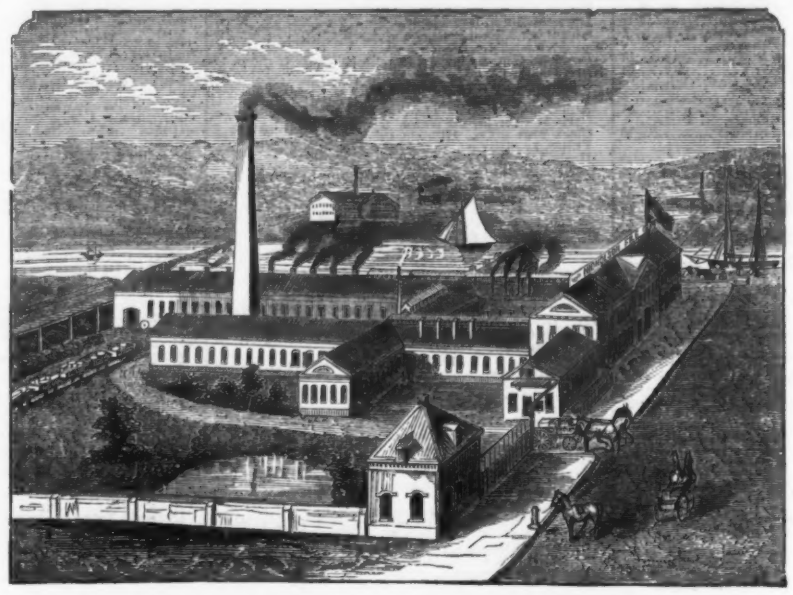
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Size, ⅛ in., per dozen	$6·00	Size, 1⅛ in., per dozen	$10·00
" ¼ " "	6·50	" 2 " "	12·00
" ½ " "	7·00	" 2½ " "	18·00
" ¾ " "	9·00	" 1½ " with lower case	15·00

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Seventh.—All Files under seven inches are **put up in boxes** of one dozen each, and neatly labeled.

Eighth.—The large stock carried by us, combined with our superior facilities, enables us to fill the largest orders at the shortest possible notice.

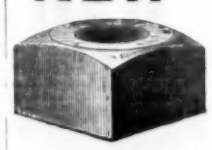
Ninth.—We are constantly making careful tests of our Files by delicately constructed machinery, which **automatically records** the **actual power applied,** forward, backward and downward, at each stroke of the File, also the number of strokes, combined with the work performed, enables us not only to judge of the **quality of our Steel for wear,** but **also of the cutting qualities** of the File, and the ease (expressed in pounds) with which a given amount of work can be accomplished.

Finally.—Our Files **are warranted** to be **hard, well cut** and **sound.** They are exclusively used by many of the largest Railroads and Machinists in the country—and the vigorous growth of our reputation, not only for making a good article, but of **our ability to furnish a good article cheap,** is evidenced by the large number of Dealers and Jobbers who are handling our Files exclusively.

NICHOLSON FILE COMPANY, Providence, R. I.

SOLD BY HARDWARE DEALERS GENERALLY.

NEW HAVEN NUT CO.,

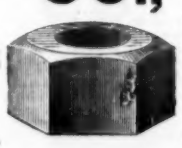


MANUFACTURERS OF

HOT PRESSED NUTS

Of Superior Quality of all sizes, both

HEXAGON & SQUARE,



From ¼ inch to and including 1½ inch Bolt.

Factory and Office, - - - - - - - WESTVILLE, CONN

SUPPLIES

FOR

Railways, Machinists and Amateurs,

Gum and Leather Belting, Packings and Cotton Waste, Babbit Metal.

FINE TOOLS

for Machinists and Amateurs; Barnes' Foot Power Scroll Saw; Foot Lathes all kinds. Sole Agents Baxter Steam Engine. Iron and Wood Working Machinery. Send for Price Lists.

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AND

SAFE DEPOSIT CO.

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IRON STORAGE YARDS:

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N. W. cor. Third & Chestnut Sts

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MANUFACTURERS OF

Continental Locks.
Excelsior Dividers.
Excelsior Calipers.
Axes of the celebrated brands:
"Queen of the Forest."
"Wood Choppers' Pride."
Wetmore's Hatchets.
Tackle Blocks.
Brad Awls and Tools, (in sets.)

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Newbould's Files, Chisels, Plane Irons and Tools.
Baldwin's Solid Cast Steel Carpenters' Hammers, Mining and Blacksmiths' Sledges and Tools.
Davis Level and Tool Co.'s celebrated Patent Adjustable Plumbs and Levels and Inclinometers.
Improved Iron Bench Planes and other Tools.
Chapin Machine Co.'s Boring Machines.
Humphrey & Bartlett's Horse Brushes.
H. Chapin's Son's Rules, Planes, Gauges, Plumbs and Levels, Try Squares, T Bevels, Hand Screws, &c.

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Stubs' Files.
French Coffee Mills, and General Hardware and Cutlery.

A complete and extensive stock always in store.
Catalogues mailed on application.

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Engineer, Machinist & Blacksmith,

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Drawings made to order. Repairing of all kinds promptly attended to. Blacksmithing executed in all its branches.

Designing & Engraving

ON WOOD.

Done in the best manner at the office of *The Iron Age* and *The Metal Worker*,

10 Warren Street, New York.

Estimates given for Catalogues, Posters, &c.

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Forrest Buildings

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AND MARBLE BUILDINGS

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H. HOWSON, Solicitor of Patents. | C. HOWSON Attorney Law.

Communications should be addressed to the PRINCIPAL OFFICES PHILADELPHIA.

COX & COX,

Counsellors at Law,

229 Broadway, NEW YORK.

Practice in cases relating to

PATENTS and TRADE MARKS.

Before the

Courts and Patent Office.

Burke & Fraser,

SOLICITORS OF

PATENTS

37 PARK ROW, N. Y. CITY.

Established 1851. *Also Consulting Engineers.*

PATENTS. Thomas D. Stetson, No. 23 Murray St., N. Y. Solicitor of Patents, and Scientific Expert in patent cases.

Send for circular.

HENRY DISSTON & SONS,

Keystone Saw, Tool, Steel and File Works,

Front and Laurel Streets, Philadelphia.

Branch Works, Tacony, Philadelphia. **Branch House, Randolph & Market Streets, Chicago, Ill.**

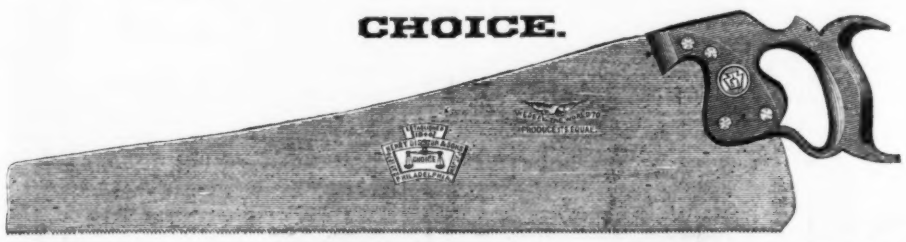
MANUFACTURERS OF

SHEET STEEL, and all Articles made from Sheet Steel.

SAWS OF EVERY DESCRIPTION.

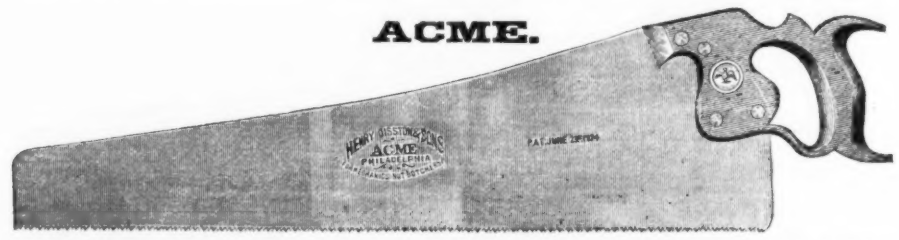
Also, FILES, TOOLS, Etc., and all kinds of Labor Saving Implements for keeping Saws in perfect order.

HENRY DISSTON & SONS'
New Patent Skew-back Hand-Saw,
CHOICE.



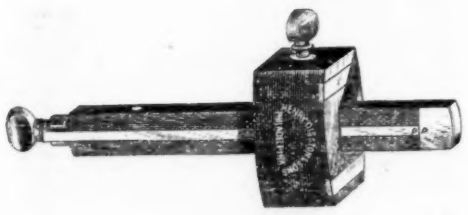
This Saw is the "CHOICE" of all first-class Mechanics who have used it.

HENRY DISSTON & SONS'
New Patent Skew-back Hand-Saw,
ACME.



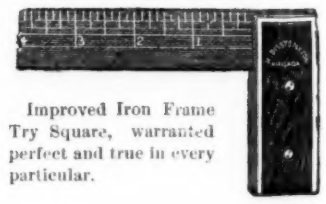
We consider these Saws to be the ACME of perfection. So say all first-class Mechanics who have used them.

HENRY DISSTON & SONS'
Patent Skew-back Hand-Saw
NEW No. 7.





Even in price and quality with our celebrated No. 7 Saw. Warranted to give satisfaction every time.

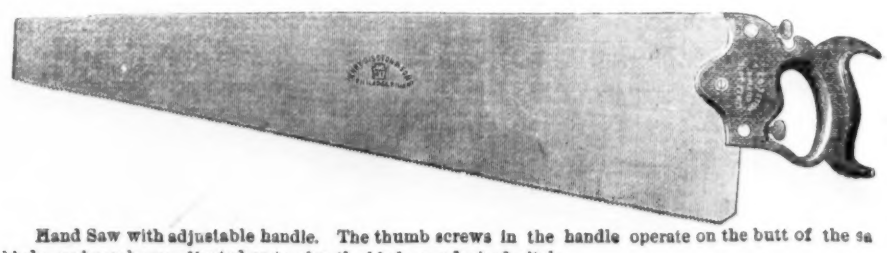


Improved Iron Frame Try Square, warranted perfect and true in every particular.

It is singular, yet true, that although immense improvements have been made of late years, in the grinding, temper, and finish of Hand Saws, still in shape and style they much resemble the Hand Saws of centuries ago. We have recently patented a Hand Saw, which, we believe, combines numerous advantages over the old-style Saw, being lighter and more easy to handle, stronger in proportion to the amount of metal in the blade, and more free from tremor when in use than the ordinary Hand Saw. To these Saws are attached our new patent handles, which possess many advantages over the old style. They bring the operator closer to his work, and in some of them the blade of the saw is imbedded in the handle, imparting strength in case of an accidental blow or a fall. The Rip Saw handle is coped out to admit the thumb of the left hand, and thus give the operator unlimited power and command over the Saw when it is desirable to use both hands.



A cheap Saw, fully guaranteed. Six tools in one. Adapted to farmers' or plantation use. A Rip and Cross-Cut Saw, Square, Rule, Straight Edge and Scratch Awl combined.



Hand Saw with adjustable handle. The thumb screws in the handle operate on the butt of the sa blade, and can be so adjusted as to give the blade any desired pitch.

New York Wholesale Prices, July 28, 1875.

HARDWARE.

Anvils.
Solid Cast Steel.....₱ ℔ 14c
Wright's.....₱ ℔ gold 11c; over 250 ℔s 11½c, gold
Armitage's Mouse Hole.....gold 11c
Wilkinson's.....₱ ℔ gold 11c
Eagle Anvils.....₱ ℔ 8c

Apple Parers.
Domestic
Turn Table
Lightning
Hudson's
Reading
Union
} $7.75 ₱ doz
Skeleton Paring, Coring and Slicing.....$5 00 ₱ doz net
Bay State, Paring, Coring and Slicing.....$15 00 dis 10 %
Climax Slicer.....8 00

Augers and Bits.
Douglass
Ives
Beecher(French,Swift&Co)
Griswold
Challenge
} 1st quality.....dis 40&10 %
Nobles Mfg. Co.....dis 40 @ 40&5 %
Cook's.....d's 40&10&10 %
Snell Mfg. Co.....dis 22½ @ 25 %
Jennings' Bits.....dis 10 %
Lewis' Single Twist Bits.....dis 30 %
Andrews' Bits.....dis 25 %
Griswold's Patent Bits.....dis 20 %
Expansive Bits, Clark's...small, $18; large, $26—dis 15 %
" " Ives'.....$20 @ $30—dis 30 %
" " Blake's.....$20—dis 40 %
Hollow Augers, Douglass'
" " Ives'
" " French, Swift & Co.
" " Bonney's Adjustable.₱ doz $48—dis 25 %
" " Stearns' " .₱ doz $48—dis 25 %
" " Ives' Expansive.....each $4 50—dis 40 %
" " Universal Expansive,each $4 50—dis 10 %
} dis 40 %
Gimlet Bits—Screw, $7 50; no screw, $9.....dis 20&10 %
Double Cut Gimlet Bits, Shepardson's.....dis 20 %
" " Hartwell's.....dis 50 %
" " Douglass'.....dis 20&10 %
" " Ives'.....dis 30 %
Morse's Bit Stock Drills.....dis 20 %
L'Hommedieu's Ship Augers.....dis 15 @ 20 %
Watrous Ship Augers.....dis 15 %
Vaughan's Post Hole—
6 in. $23 60; 7, 8 and 9 in. $25 per doz.....dis 20 %

Awls, Brad Sets, &c.
Awls, Sewing.....per gross $1 20—dis 10 %
" Shouldered Peg.....per gross 2 25—dis 10 %
" Patent Peg.....per gross 60—dis 10 %
" Shouldered Brad.....per gross 2 25—dis 10 %
Brad Sets, Aiken's.....dis 25 %
" Nos. 42 and 43.....dis 40&10 %
" Clark's.....dis 30&10 %
" Stanley's Excelsior.....$13 50—dis 25&10 %

Axes.
Brook's.....per doz $12 00 @ 14 00 net
Blood's.....₱ doz $12 50 @ 14 00
Hunt's.....₱ doz 10 50 @ 12 50
Collins'.....₱ doz 11 00 @ 15 50 net @ dis 5 %
H. Clark's (J. C. W. & Co.) brond'or red.₱ doz $10 00 net
Hurd's.....₱ doz 10 50 @ 12 50
Simmons'.....₱ doz 11 00 @ 11 50
Morris'.....₱ doz 12 50 @ 13 50
Red Jacket.....₱ doz 12 00 @ 12 50
Man's.....₱ doz 11 50 @ 13 00
" Double Bitted.....₱ doz 21 50 @ 22 00
Underhill's.....₱ doz 12 00 @ 13 00
" Crown.....₱ doz 12 50 @ 13 50
John Leverett's.....₱ doz 12 50 @ 15 50
Fen Eyck.....₱ doz $10 00 @ 12 50 net
M. H. Jones & Co.....₱ doz 10 50 @ 11 50 net
Nobles Mfg. Co.....per doz $10 50, net
Balances.....dis 35 %

Bands.
Plated.....new list dis 50&5 %
Iron (Plated list).....new list dis 25&5 %
Brass (Plated list).....new list dis 50, 10&5 %
Oroide.....new list dis 50&5 %

Bells.
Hand, Light Brass.....dis 70&10 %
" Extra Heavy.....dis 40&10 %
" White Metal.....dis 50&10 %
" Silver Chime.....dis 15&10 %
" Swiss.....dis 25 %
" Globe (Cone's Patent).....dis 15&10 %
Gong Abbe's.....dis 15&10 %
" Yankee.....dis 30&10 %
" Barton's.....dis 33 %
Crank, Taylor's.....dis 25 %
" Brook's.....dis 50 %
" Cone's.....dis 10 %
" Connel's.....dis 50&10 %
Lever, Sargent's.....dis 60&10&10 %
" Taylor's.....dis 25 %
" Hart, Bliven & Mead Mfg. Co.....dis 50&10 %
Full, " " " .....dis 50 %
" Brook's.....dis 25 %
" Western.....dis 15 %
Call.....dis 20&10 %
Cow -Common Wrought.....dis 20&10 %
" Western.....dis 20&10 %
" Sargent's.....dis 50&10&10 %
" Kentucky "Star".....dis 20&10 %
" Sargent's.....dis 50&10&10 %
" Dodge's Genuine Kentucky, new list—

Nos.	0	1	1½	2	3	4	5	6	Hog.
$12 00	10 00	9 00	8 00	6 00	5 00	3 50	2 50	5 00	dis 45 %

" Yaw's Genuine.....dis 30 %
" Texas.....dis 35 %

Bellows.
Blacksmiths'.....dis 20 %
Moulders'.....dis 20 %
Hand Bellows.....dis 10 %

Blind Adjusters.—Domestic.....₱ doz $3—dis 20 %

Blind Fasteners.
Mackrell's.....dis 30 %
Van Sand's, No. 2000, $14 00; No. 3705, $10 50.....net
Washburn's Patent.....₱ gross $14 00 net
Merriman's.....new list net

Blind Staples.
Boardman's Patent, ½ in. and larger.....₱ ℔ 37 c
" ⅜ in....." " 42 c

Blocks.
Tackle, Rope and Iron Strapped, Providence Tool Co.'s list.....dis 30 %
Burr's.....dis 10 %
Stanley Rule and Level Co.....dis 25&10 %

Bolts.
Cast Iron Barrel, Shutter, &c.....dis 60&10 %
Cast Iron Chain.....dis 60&10&10 %
Wrought Iron Barrel.....dis 50, 10&10 %
" " Square.....dis 60&10 %
" " Shutter.....dis 15&10 %
Wrought Iron Flush, Stanley's.....dis 15&10 %
" " " Sargent's.....dis 50&10&10 %
Carriage and Tire, Common.....dis 75 %
" " " Norway Iron.....dis 50&10 %
" " " R. B. & W.....(old list) dis 60 %
" " " Philadelphia, Star.....dis 55 %
" " " Eagle.....dis 55 %
Union Nut Company, old list.....dis 60&10 %
Stove.....dis 25 %
" R. B. & W.....dis 25 %

Borax......15c. ₱ ℔

Boring Machines.
Kellogg's.....dis 15 %
Snell Mfg. Co., Rice's Patent.....dis 20 %
" " Regular.....dis 20 %
Douglas Mfg. Co.....No. 5, $3 25; with Augers, $5 00 net
No. 2, 4 00 " " 6 00 net
Pair's.....dis 30&10 %
Phillips' Angular, complete with Augers.....each $7 25
Mortising Machines, $20 00 each.....dis 20 %

Bow Pins.
Union Nut Co.....new list dis 50&10&5 %
Hotchkiss'.....dis 50 @ 55 %
Humason, Beckley & Co.'s.....dis 50&10&5 %
Sargent & Co.'s.....dis 50&10&10 %

Braces.
Barber's Patent.....dis 40&5 %
Q. S. Jackus.....dis 40&10 %
Wilson Mfg. Co.....dis 10 %
Spofford's Patent.....dis 50 %
Noble's Patent.....dis 40&5 %
Ives Novelty.....dis 40&7½&10 %
" Hamden.....dis 15&10 %
Common Ball.....dis 15&10 %

Brackets.—Shelf.....dis 60&10 @ 65&10 %

Bright Wire Goods......dis 50&10&5 %

Butt Rings.—Union Nut Co., new list.dis 50&10&5 %
Sargent's.....dis 60&10 %
Hotchkiss'.....2½ in., $2 25 net

Bung Hole Borers.
Common and Ring.....dis 20&10 %
Enterprise Mfg. Co.....dis 10&10 @ 25 %
Enterprise Mfg. Co.....dis 20 %

Butchers' Cleavers.
Humason & Beckley Mfg. Co.....dis 20&10 %
Bradley's.....dis 25 %
Beatty's.....dis 20 %

2	3	4	5	6	7	8	9
$19 00	$21 50	$24 00	$27 00	$30 00	$33 50	$36 50	$40 00

Hart Mfg. Co.....dis 45&10 %

0	1	2	3	4	5	6
$25 25	$29 75	$34 25	$38 75	$43 25	$48 50	$54 00

Butts.
Wrought Brass.....dis 20 %
Cast Brass.....dis 20 %
Common Cast, not Drilled.
Fast Join', Narrow,.....New list July 1 dis 30&10 %
" Broad " " dis 40&10 %
" " Jap'd. " " dis 50&10 %
Loose Joint, Narrow and Broad " dis 50&10 %
" " " Jap'd " dis 45&10 %
Parliament Butts & Mayer's Hinges " dis 45&10 %
Loose Pin " dis 50&10 %
" " Plated Tips " dis 50&10 %
Drilled and Wired.
Fast Joint, Narrow.....New list July 1, dis 25&10 %
" Broad " " dis 35&10 %
" " Jap'd, with and without Acorns " dis 30&10 %
Loose Joint " dis 45&10 %
" Jap'd with and without Acorns " dis 45&10 %
Parliament and Mayer's Hinges " dis 35&10 %
Loose Pin " dis 45&10 %
" Japanned " dis 50&10 %
" " Plated Tips " dis 45&10 %
Union Mfg. Co., Figured Enameled L. J.....dis 55&10 %
" " Nickel Pl. L. J. Capped Iron and Bronze.....dis 33⅓&10 %
" " Boston Finish, Plain, without Acorns.....dis 80&5 %
" " Boston Fin. with Iron Acorn..dis 75&5 %
" " " Silvered " ..dis 60&5 %

Wrought Iron.
Fast Joint, Narrow, Lt. and Regular.....dis 30 %
" " Broad.....dis 35 %
Loose Joint, Narrow and Broad.....dis 35 %
Table Butts, Back Flaps, &c.....dis 30 %
Inside Blind, Regular.....dis 30 %
" " Light.....dis 40 %
Loose Pin, Wrt.....dis 35 %
Am. Spiral Spring Butt Co., list May 18t.....dis 25 %
Union Spring.....dis 20 %
Blind Butts, Parker.....dis 60 @ 60&10 %
" Palmer.....dis 40 %
" Seymour.....dis 55&10 %
" Shepard.....dis 60 @ 60&10 %
" Lull & Porter.....dis 60 %
" Nicholson.....dis 45&10 %
" Huffer.....dis 33⅓&10 %
" Garretson, No. 1.....dis 60 @ 60&10 %
" Clark's, Nos. 1, 3 and 5.....dis 60 @ 60&10 %
" Clark's No. 2.....dis 60&10 @ 65&10 %
" Nos. 2, 4, 4½, 6, 8, 10.....dis 40 %

Caps—Percussion, per 1000.
G. D.....37 @ 40c
Ely's E. B.....1-4s. 58c.; 1-10s. 70c. gold
" Double Waterproof, 1-4s, $1 45; 1-10s, $1 52½c., gold
" Colt's.....1-10s 80c gold

Carpet Sweepers.
Union.....each $2 75 net
Welcome.....each 2 75 net

Cartridges.—Metallic.....dis 50&10 %

Cards.—Horse and Curry.....dis 30&10 %
Cotton.....dis 10&10 %
Wool.....dis 15&10 %

Carpet Stretchers.
P. S. & W.....per doz $2 00; dis 40&5 %
Sargent's.....per doz $2 88—dis 50&10&10 %

Casters.
Bed.....dis 30&10 @ 40 %
Plate and Shallow Socket.....dis 40&10 %
Deep Socket.....dis 33⅓ %

Cattle Leaders.....new list dis 60&10 %

Chain
English Coil.....net gold

₱ ℔	11½	8⅝	7⅛	7/8	1¼	7c
	8-16	⅝	5-16	⅝	7-16	⅝

Trace, 6½-10-2.....by the cask, ₱ pair, gold 55c
Trace, 1-10-2.....by the cask, ₱ pair, gold, 62c
German Halter Chain.....dis 20 % gold
German Coil.....dis 20 % gold
Galvanized Pump Chain.....₱ ℔ 13c
Jack Chain, Iron.....dis 50&10 %
" Brass.....dis 40&10 %

Chalk.
White.....₱ gross, 57c net
Red.....₱ gross, 90c net
Blue.....₱ gross, $1 00 net
White Crayons.....₱ gross, 16¼c net

Chisels.
Socket Framing, Douglass, Extra.....dis 60&10&10 %
" " Crossman.....dis 50&15&10 %
" " Buck Bros...equivalent to dis 50&15 %
" " Hart Mfg. Co.....dis 60&10 %
" " Merrill.....dis 60&10 %
" Firmers, Douglass, Extra.....dis 60&10 %
" " Crossman.....dis 50&10&10 %
" " Buck Bros.....equivalent to dis 50&15 %
" " Hart Mfg. Co.....dis 60&5 %
" " Merrill.....dis 60 %
Socket Corner.....dis 60&10 %
Tanged Firmers.....dis 40&10 @ 50 %
Butcher's.....$5 50 to £ gold
Newbould's.....$5 50 to £ gold
Spear & Jackson's.....$5 50 to £ gold
Buck Bros (Shank).....$5 50 to £ gold

Clamps.
Cabinet.....dis 60&10 %
Gray's.....dis 20 %
Lauben's.....dis 20 %
Providence Tool Co.....dis 10 %

Clips, Axle.
Norway or Best.....dis 40 %
Superior.....dis 50 %
"Star," Superior Philadelphia.....dis 45&5 %

Coal Shovels.
Edgar's Pat. "Gem," Short and Long H'dled.....dis 15 %
Iron Handled.....₱ doz, $ 85 @ 1 25
Wooden Handled.....₱ doz, 1 00 @ 2 00

Coal Hods.—Smith, Burns & Co.....dis 15 @ 25 %

	14	15	16	17	18	incn.
Japanned	$6 00	6 35	6 75	7 50	8 00	per doz.
Galvanized	9 50	10 09	10 75	11 50	12 50	"

Morning Glory Funnel Hods—

No.	15	16	17	
Japanned	$9 00	10 50	12 00	per doz
Galvanized	13 00	14 50	16 00	"

Sidney Shepard & Co.'s new list.....dis 10 %

Cockeyes...1¼ in., 28c.; 1½ in., 33c.; 1¾ in., 37c. net

Cocks.
Brass Racking.....dis 33⅓ %
Lock and Globe.....dis 33⅓ %
Lever Bibbs.....dis 33⅓ %
Ale and Beer.....dis 20&10 @ 25&10 %

Coffee Mills.
Board and Box.....dis 15 @ 20 %
Increase Wilson's.....dis 20 %
Selleck's Pat.....$9 50, $10 50—dis 25 %
American (Enterprise Mfg. Co.).....dis 20 %
French Steel.....dis 15 %
The Swift.....dis 20 %

Compasses and Dividers.
Bemis & Call Co.'s.....dis 35&10 %
Cook's.....dis 15 %
Excelsior.....dis 30 %
Peck Stow & Wilcox.....dis 25 %
Miller's Patent.....dis 25 %

Coopers' Tools.
Bradley's.....dis 15 @ 20 %
Chas. E. Little.....dis 20 @ 25 %
Swan & Brombacher.....dis 15 @ 20 %

Corkscrews.....dis 25 %

Corn Knives and Cutters.
Bradley's.....dis 10 %

Crow Bars.
Cast Steel.....₱ ℔ 11c. net
Iron, steel points.....₱ ℔ 5c
Crucibles.—Gautier & Co.....₱ No. 5¼c

Curling Irons, &c.
½, ⅝, ¾ in., $1 80, $2 00, $2 40.....dis 10 %
Curling Tongs.....₱ doz $6 50—dis 15 %
Pinching Irons.....₱ doz 7 50—dis 20 %

Curry Combs.
Hotchkiss' & Kellogg's, Iron & Brass, old list..dis 30&10 %
Fitch's (List of No. 240, $1).....dis 20&10 %
Rubber.....₱ doz, $9 00—dis 15 %
Wood Tooth (Fuller Bros.).....per doz $2 25 net

Curtain Pins.—Silvered Glass.....old list dis 53⅓ %

Cutlery.
American Table { Meriden Cutlery Co } New list Jan. '75, dis 25 %
American Pocket { Cutlery Co } dis 25 %
Am. Pocket—Humason & Beckley Mfg. Co...dis 20&10 %
Naugatuck Cutlery Co.....dis 25 %

Dippers.
Britannia.....per doz 7 50—dis 30 %; by bbl. dis 33⅓ %
Cocoa, Plain.....per doz $3 25—dis 20 %
" Rimmed.....per doz 3 75—dis 20 %

Dog Collars.
Embossed Gilt.....dis 20 %
Leather.....dis 30 %
Brass.....dis 25 %

Door Springs.
Gray's.....$7 50 ₱ doz—dis 50&10 %
Torrey's Patent.....$7 50 ₱ doz—dis 55 @ 55&10 %
Johnson's.....per doz $3 00 @ 4 00
Palmer's Japanned No. 6.....₱ doz $5 00 } dis 20 %
" Coppered " .....6 00 }
" Silvered " .....8 00 }
Challenge,—
Japanned.....No. 9, per doz $4 00 }
No. 7, " 5 00 } .....dis 40 %
No. 6, " 6 00 }
Gem.—No. 1 large, Japanned.....per doz $4 00 }
No. 2 medium.....per doz 3 50 } dis 10 %
No. 3 small.....per doz 3 00 }
Barker's Concealed.....dis 12½ %

Drawing Knives.
Crossman's No. 1.....dis 50&15&10 %
Douglass, Extra.....dis 60&10&10 %
Hart Mfg. Co., No. 1.....dis 60 %
Merrill.....dis 60&10 %
Nobles Mfg. Co.....dis 15 %
Bradley's.....dis 25 %
Adjustable Handle.....dis 15 %

Drills and Drill Stocks.
Blacksmiths'
" Self-Feeding.....each $2 60 net
.....each $8 00 net
Breast, P. S. & W.....dis 45 %
" Miller's Falls.....dis 25 %
" Aiken's.....dis 40 %
" Hotchkiss'.....dis 10 %
" Wilson's.....dis 10 %
Ratchet, Merrill's.....dis 20 %
" Ingersoll's.....dis 35 %
" Whitney's.....dis 20 %
" Weston's.....dis 20 %
" Moore's Triple Action.....dis 20 @ 25 %
Wilson's Drill Stocks.....dis 10 %
Automatic Boring Tools.....each $2 25—dis 20 %

Drill Chucks.—The Danbury..each 10 00, dis 20 @ 25 %
Beach Patent (Morse).....dis 15 %

Egg Beaters.

Mouroe's.....	8 in.	10 in.
Per doz	$8 00	9 00

.....dis 10 %
Dover.....₱ doz $6 00—dis 10 %
National.....₱ doz $4 50—dis 20 %
Peerless.....₱ doz $4 00—dis 10 %

Emery.
Genuine Chester—Regular Nos.....₱ ℔ 6c } dis 10 %
" " Flour and FF.....₱ ℔ 4c }
Washington Mills—Regular Nos.....₱ ℔ 8c
" " Flour.....₱ ℔ 5c

Enameled and Tinned Ware.
Kettles.....dis 30 @ 40 %
Sauce Pans.....dis 25 %
Glue Kettles.....dis 20 @ 25 %
Tinned Saucepans.....dis 25 %

Escutcheons.
Door Lock.....Same discounts as Door Locks
Brass Thread.....dis 60&10 %
Wood.....dis 25 %

Faucets.
Fenn's.....dis 50 %
" Cork Stops.....dis 40 %
Star.....dis 55&10 %
Frary's Patent Petroleum.....dis 15&10 %
Taylor's Pattern " .....dis 20&10 %
Wood and Metallic.....dis 40 %
Wood, Cork Lined.....dis 60&10 %
Enterprise Mfg. Co., Self-Measuring.....dis 25 %

Feltloe Plates.....₱ ℔ 15c; dis 25 %

Files.
American File Co.....$5 00 to £ currency—dis 15 @ 20 %
Arcade File Works.....$5 00 to £ currency
Auburn File Co.....$5 00 to £ currency
Nicholson.....new list, Jan. 1, 1875, net
Hartford File Co.....$5 50 to £ currency—dis 10 %
L. B. Heller & Co.....$5 00 to £ currency
Heller & Bros.....$5 00 to £ currency
" Western".....5 00 to £ net
Wheeler, Clemson & Co.....$5 00 to £ currency
Rothery's.....$5 to £ currency
Black Diamond.....$5 to £ currency, dis 10 %
J. & Riley Carr.....5 25 to £ gold
" Horse Rasps.....5 50 to £ gold
Stubs'.....5 50 @ ₱ 00 to £ gold
Butcher's.....5 25 to £ gold
Walter Spencer & Co.'s "Diamond".....5 00 to £ gold
Spear & Jackson's.....5 00 to £ gold
Jowitt's.....5 00 to £ gold
Newbould's.....5 25 to £ gold
W. K. & C. Peace's "Imperial".....5 25 to £ gold
R. Ibbotson.....5 00 to £ gold
Turton Bros. & Matthews.....$5 50 to £ currency
Ashworth's (Van Wart & McCoy).$5 00 to £ cur. dis 10 %
Fisher's.....4 75 to £ gold
Goodlad's.....4 00 to £ gold
Moss & Gamble.....5 25 @ 5 50 to £ gold
Thos. Turner & Co. (Peter A. Frasse & Co.).....5 00 to £ gold
" " Horse Rasps.....5 25 to £ gold
"Philo Sheffield," P. T. Co.....5 00 to £ gold
Limet & Co. (French).....5 00 to £ gold

Fluting Machines.
Mrs. Coles' Pony..4 in., $4 75; 5 in., $5; 6 in., 5 50; 7 in., $6
Knox, with 4-inch Rolls.....3 80 each net
" " 6 " .....5 75 each net
" " 8 " .....6 50 each net
O. K.....4 00 each net
Peerless, 4-inch Rolls.....4 75 each net
" 5 " " .....4 75 each net
Excelsior, No. 1.....6 50 each net
" No. 2.....7 50 each net
Diamond.....7 50 each net
Champion, 6 inch rolls.....$6 00 each net
" 4 inch rolls.....$5 00 each net
Climax 7-inch Rolls.....8 00 each net
" 4½ " .....6 50 each net
Empire.....4 00 each net
Eureka, No. 1, 7-inch Roll.....8 00 each net
" No. 2, 5-inch Roll.....6 00 each net
K. F. M., 4½-inch Roll.....5 50 each dis 15 %
" 6-inch Roll.....6 00 each dis 15 %
Myers' Fashion Fluter, 4½-inch Rolls.....2 75 each net
" Convex Brass Fluter, Sad Iron attachment..$1 75
Domestic Fluter.....$1 50 each net
Fairy, Self-Heater.....00 each net
Geneva Hand Fluter.....$15 00 per doz net

Fluting Scissors.....dis 25&10 %

Forges.

Forks.
'Empire" (W. P. Kellogg & Co.).....dis 20 %
Hay, Manure & Spading.....dis 33⅓ %
Plated A 1.....dis 50 %

Fry Pans.
Burnished, P. S. & W., new list.....dis 45 %
₱ doz.....$3 00 3 75 4 25 4 75 5 25 6 00 7 00 8 00 9 00
No.....0 1 2 3 4 5 6 7
Smith, Burns & Co., "Excelsior" Polished.....dis 35 %
₱ doz.....$2 70 4 00 4 70 5 20 6 00 7 00 8 00 9 00
No.....1 2 3 5 6 7 8

Gas Stoves.
Tiff & Howard.....dis 20 %

Gauges.
Marking.....dis 45&10 %
Wire.....dis 10 %
" Smith's Patent.....per doz $18 00, dis 40 %

Gimlets.
Nail and Spike.....dis 25&10 %
Double Cut, Shepardson's.....dis 20 %
" Ives'.....dis 25 %
" " Douglass'.....dis 20&10 %

Grind Stone Fixtures
Sargent's Patent.....dis 65&10 %
Reading Hardware Co.....dis 65&10 %
J. F. Green & Bro.....dis 40 %
Hart Mfg. Co.'s.....dis 60&5&10 %

Hammers.
Emmet Hammer Co.'s Handled.....dis 30 %
" Sledge & Stone....₱ ℔ 40c dis 45 %
Humason & Beckley Mfg. Co.....dis 16⅔&10 %
Maydole's.....dis 12 %
Cheney's.....net
Verree.....dis 5 %
Yerks & Plumb.....dis 12½ %
Magnetic Tack.....dis 25&10 %
Warner & Noble's.....dis 10 %

Hand Cuffs and Leg Irons.
Tower's Hand Cuffs, $4 00 per pair.....
" Leg Irons $6 50 per pair.....
} dis 25 %
Providence Tool Co.'s Hand Cuffs..$15 per doz
" " Leg Irons 25 "
} dis 10 %

Handles.
Door or Thumb Latches—

Nos.	0	1	2	3	4	
Per doz	$ 80	1 00	1 18	1 85	1 50	dis 60 %

Roggin's Latches.....40c. @ 50c. net
Bronzed Iron Drop Latches.....per doz $1 30 net
Wrought Chest.....dis 60&10 %
Surface Chest.....dis 65&10&10 %
Flush Chest.....dis 60&10&10 %
Lifting.....dis 60&10 %
Coffin.....dis 50&10 @ 60&10 %
Saw and Plane.....dis 20&10 %
Hammer and Hatchet.....dis 10 %
Brad Awl.....per gross $3 50—dis 20&10 %
Hickory Firmer Chisel, ass'td " 5 25—dis 20&10 %
" " " large " 6 50—dis 20&10 %
Apple " " ass'td " 6 00—dis 20&10 %
" " " large " 7 50—dis 20&10 %
Socket " " ass'td " 3 50—dis 20&10 %
" Framing " " " 7 00—dis 20&10 %
File.....4 00—dis 20&10 %
Auger.....6 50—dis 20&10 %
" large " 9 00—dis 20&10 %
Patent Auger, Ives'.....dis 25&10 %
" " Douglass'.....per set $1 25—dis 10 %
" " Swan's.....per set $1 00—dis 10&10 %

Hangers.
Barn Door.....dis 65&10 %
"Anti-Friction" (Rider, Wooster & Co.).....dis 30&5 %
Novelty.....dis 30 %

Harness Snaps.
Henshaw's.....dis 25&10 %
Judd's.....dis 40 %
Fitch's (Bristol).....dis 30 %
Hotchkiss'.....dis 10 %
Andrews'.....dis 25 %
Sargent's.....dis 50&10 %
New York Wire.....dis 20&20 %

Hatchets.—Isaian Blood.....dis 15 %

Shingling, Nos.	1	2	3		₱ doz	$7 25	8 00	8 75
Claw,	1	2	3		₱ doz	7 75	8 50	9 25
Lathing,	1	2	3		₱ doz	7 50	8 00	8 50

Hurd's.....dis 10 %

Shingling, Nos.	1	2	3	₱ doz	$7 25	8 00	8 75
Claw,	1	2	3	₱ doz	7 75	8 50	9 25
Lathing,	1	2	3	₱ doz	7 50	8 25	9 00

Hurd's.....dis 25 %

Shingling, Nos.	1	2	3	₱ doz	$8 00	8 50	9 00
Claw,	1	2	3	₱ doz	9 00	9 50	10 00
Lathing,	1	2	3	₱ doz	8 00	8 50	9 00

Newark's Edge Tool Co.'s.....dis 25 %

Shingling, Nos.	1	2	3	₱ doz	$6 50	7 00	7 50
Claw,	1	2	3	₱ doz	7 25	7 75	8 25
Lathing,	1	2	3	₱ doz	6 50	7 00	7 50

Yerkes & Plumb.....dis 15 %

Shingling, Nos.	1	2	3	₱ doz	$7 00	7 50	8 00
Claw,	1	2	3	₱ doz	7 50	8 00	8 50
Lathing,	1	2	3	₱ doz	7 00	7 50	8 00

Simmon's.....dis 15 %

Shingling, Nos.	0	1	2	3	₱ doz	$7 50	8 00	8 50	9 00
Claw,		1	2	3	₱ doz		9 00	9 50	10 00
Lathing,		1	2	3	₱ doz		8 00	8 50	9 00
Broad,		1	2	3	₱ doz		9 00	10 00	12 00
"		4	5	6	₱ doz		14 00	16 00	18 00
"		7	8		₱ doz		20 00	22 00	

Elephant.....dis 25 %

Shingling, Nos.	1	2	3	₱ doz	$8 00	8 50	9 00
Claw,	1	2	3	₱ doz	9 00	9 50	10 00
Lathing,	1	2	3	₱ doz	8 00	8 50	9 00

J. P. Verree & Co.....dis 5 %

Shingling, Nos.	1	2	3	₱ doz	$7 00	7 50	8 00
Claw,	1	2	3	₱ doz	7 50	8 00	8 50
Lathing,	1	2	3	₱ doz	7 00	7 50	8 00

Underhill's.....dis 10 %

Shingling, Nos.	1	2	3	₱ doz	7 25	8 00	8 75
Claw,	1	2	3	₱ doz	7 75	8 50	9 25
Lathing,	1	2	3	₱ doz	12 00	11 00	13 00

M. H. Jones & Co.....dis 25 %

Shingling, Nos.	1	2	3	₱ doz	$8 00	8 50	9 00
Claw,	1	2	3	₱ doz	9 00	9 50	10 00
Lathing,	1	2	3	₱ doz	8 00	8 50	9 00

Hay Knives.—"Lightning".....per doz $10 00 net

Hinges.
Gate, Western.....₱ doz $6 25—dis 60&10 %
" N. E.....₱ doz 11 25—dis 6 .&10&10 %
" N. Y. State.....₱ doz 7 20—dis 60&10 %
Rolled Plate.....dis 65&10 %
" Raised.....dis 65&10 %
Wrought Strap and T.....dis 33⅓&10&5 %
Providence Plate. { 6 and 8 in. 11c ₱ ℔ / over 8 in. 9½c ₱ ℔ } .....dis 30 %
Screw Hook and Strap. { ⅝, ¾, 12 in. 6¼c / 14 to 36 in. 5½c } .....net
Heavy Welded Hook. { 5 to 12 in., 8¼c / 14 in & up, 6c } .....net
Screw Hook and Eye. { ⅞ to 1 in., 8¼c / ⅝ in. 9¼c / ½ in. 11¼c } .....net

Hoes.
Solid Shank, C. S.....₱ doz $8 00—dis 35 %
Socket.....₱ doz 9 00—dis 35 %
Riveted Eye.....₱ doz 5 00—dis 35 %
Grub.....dis 25 %
Planters.....net @ dis 5 %
Scovill.....add 33⅓ %
Scovill Pattern.....net @ dis 5 %
Lane's C. S. Cresent, American Pattern.....list net
" " Scovill Pattern.....add 10 %

Hooks.
Bird Cage.....dis 60&10 @ 70&10 %
Cotton.....dis 50 %
Belt.....dis 55 @ 60 %
Bench—Hotchkiss' $5 00 ₱ doz.....dis 10 %
" Weston's No. 1, $8 00; No. 2, $7 00 per doz net
" McGill's.....$3 00 per doz, dis 10 %
" Skinner's.....per doz $6 25, dis 20 %
Clothes Line, Harness, Wardrobe, Hat and Coat, Ceiling. { Hart's list.....dis 60&10&10 % / Sargent's list.....dis 6 .&5&10 % / Reading list.....dis 35&10 % }
Wrought Staples and Hooks and Staples.....dis 70&10 %
Wire Screw Hooks and Eyes.....dis 65&10&10 %
Grass.....dis 2 %
Whittletree—Patent.....dis 30 %
Hooks and Eyes—Malleable Iron.....dis 60&10&10 %
" Brass.....dis 60&10&10 %

Horse Nails.

Nos.	5	6	7	8	9	10
American Pressed....₱ ℔	22c	20c	20c	20c	20c	20c
Ausable, "	10c	27c	25c	24c	23c	22c
" P't'd & Pol'd.. "	31c	28c	26c	25c	24c	23c
" " & Blued.. "	32c	29c	27c	26c	25c	24c
Brundage, "	29c	26c	24c	23c	22c	21c
Buffalo Forged, "	31c	28c	26c	25c	24c	23c
Globe, P't'd & Pol'd... "	31c	28c	26c	25c	24c	23c
National, Pointed and Polished, Pat. Fin... "	29c	25c	23c	22c	21c	20c
National, Pointed and Polished, Ex. Fin... "	30c	27c	25c	24c	23c	22c
Perkins' Pointed and Polished, "	30c	27c	25c	24c	23c	21c
Perkins' Pointed and Blued, "	31c	28c	26c	25c	24c	22c
Putnam, "	32c	28c	26c	25c	24c	23c
Vulcan, P't'd & Blued. "	33c	30c	28c	27c	26c	25c

Star brand, 16c.; Morgan.....14c
Putnam.....3000 lbs., dis 5 %
Ausable, Am. Pressed, Perkins, Globe, National and New London.....1000 lbs., dis 5 %
Vulcan.....1000 lbs., dis 7½ %
Vulcan and Brundage.....500 lbs., dis 5 %

Horse Shoes.
Burden.....₱ keg, $5 00
R. I. Horse Shoe Co., Perkins Pattern.....₱ keg, 5 00
" " " R. I. Pattern.....₱ keg, 5 87½
Mule Shoes.....₱ keg, 6 00
Perkins' Snow.....₱ keg, 6 62½

Kettles.
Brass.....₱ ℔ 45c net
Enameled.....dis 30 @ 40 %

Knives.
Ames' Butcher Knives.....dis 20 %
" Shoe " .....dis 15 %
" Bread " .....₱ doz $1 50—dis 15 %
Hay and Straw, "Wadsworth's".....dis 20 %
Table and Pocket.....See Cutlery

Knobs.
Carriage (Jap'd 80 cents per gross).....dis 60&10 %
Base—Common.....net
" Plush Tip.....dis 10 %
" Elastic End, No. 8.....dis 30&10 %
Door, Mineral.....₱ doz $2 23
" Por. Jap'd.....₱ doz 3 00
" " Plated.....₱ doz 7 00
" " Por.....₱ doz 7 50
} .....dis 40&2 %
Furniture, Plain.....75c gross inch, dis 10 %

Ladles.
Melting, Hart's.....dis 55&10 %
" Sargent's.....dis 50&10 %
" Reading.....dis 15&10 %

Lanterns.
Tubular.....No. 0, $11 00; No. 1, $14 00 net
Peerless.....No. 5, per doz $11 75—dis 10&10 %
Brady's Patent.....dis 10 & 10 %
Etna.....dis 10 & 10 %
Yankee.....dis 10 & 10 %
De Beque.....dis 10 & 10 %

Lard Presses.
Draw Cut, 14 inch.....each

Tin (P. S. & W.)—
Teas.....$1·50 ₱ gross, net
Tables.....2·75 " net
Stocks and Dies.....dis 5&10 %
Stone.
Hindostan Stone.....₱ ℔ 6c
" Axe Stone.....₱ ℔ 8c } dis 20&10 %
" Slips.....₱ ℔ 10c
Sand Stone.....₱ ℔ 6c—dis 20&10 %
Washita Stone.....No. 1, ₱ ℔ 22c net
" No. 2, ₱ ℔ 17c net
" Slips.....No. 1, ₱ ℔ 45c net
Arkansas Stone.....No. 1, ₱ ℔ $1·25 net
" Slips.....No. 1, ₱ ℔ $2·00 net
Grindstones, Family, J. F. Green & Bro.....dis 20 %
Stove Polish.
Joseph Dixon's.....₱ gross, 6 00
Gold Medal.....₱ gross $6 00 dis 25 %
Squares.
Steel.....dis 50 %; full cases, dis 50&10 %
Iron.....dis 50 %; full cases, dis 50&10 %
Nickel Plated.....add $2 50 @ $4 00 ₱ doz net
Try Squares and T Bevels.....dis 45&10 %
Star Try Squares and Bevels.....dis 30 %
Disston's Try Squares No. 1.....dis 20 %
" " No. 2.....dis 40 %
" " Improved.....dis 20 %
Tacks.
Full Weight American Iron.....dis 45&7½ %
Half Weight American Iron.....dis 72½&7½ %
Carpet.....dis 7½ %
Brads American Half Weight.....dis 50&7½ %
Finishing Nails.....⅝ ¾ ⅞ 1 1¼ in. and over
₱ ℔.....25c 20c 18c 14c 12c dis 7½ %
Trunk and Clout.....⅝ ¾ ⅞ 1 1¼ in. and over
₱ ℔.....25c 20c 18c 14c 12c dis 7½ %
Copper Tacks.....₱ ℔ 30c—dis 7½ %
Iron Shoe Nails, ₱ ℔ 4-8 and longer, 9½c; 8½-8, 10c.....dis 7½ %
Double Pointed.....dis 33⅓&10 %
Tapes, Measuring.
American Flask and Cap Co.....dis 20 %
Eddy's.....dis 20 %
Tea Trays.
American Tea Tray Co.....dis 15 %
Thermometers.
Tin Case.....dis 50&10 %
Toe Calks.
Winsted.....₱ ℔ 13c., dis 10&10 %
Tobacco Cutters.
Enterprise Mfg. Co. (Champion).....dis 20 %
Wood Bottom.....per doz $12—dis 25&10 %
All Iron.....per doz $19·50—dis 25&10 %
Tinners' Tools and Machines.
P. S. & W.....list net
Traps.
Newhouse.....dis 25 %
Peck, Stow & Wilcox.....dis 30 %
Blake's Patent.....dis 30 %
Mouse, Wood Choker.....₱ doz holes, 15 @ 16c
" Patent Checker (Union Nut Co.).....₱ doz holes 16 @ 18c net
" Round, Wire.....₱ doz $1 50 to 2 00 net
" Square, " .....₱ doz 2 00 to 2 50 net
" Cage, " .....₱ doz 2 50, dis 10 %
Trowels.
Lothrop's Brick and Plastering.....dis 10 %
Disston's Plastering.....dis 12½ %
Disston's Brick.....dis 12½ %
Rose's Brick.....dis 5 %
Brades' Brick.....gold. dis 10 %
Worrall's Brick and Plastering.....dis 20 %
Garden.....dis 25 %
Triers.
Butter and Cheese.....dis 25 %
Ventilators (Window).
Nickel and Gilt.....per dozen $16·00 @ 18·00
Vises.
Trenton Vises, Solid Box.
40 to 160 lbs.....16c
160 and over.....18c
Peter Wright's.....₱ ℔ 15½c. gold
Wilson's Solid Box.....dis 15 @ 20 %
31 to 160 lbs.....18c
160 and upward.....22c
Wilson's Parallel.....dis 30 %
Sargent's " .....dis 50&10&10 %
Backus & Union, Parallel.....dis 25 %
Buffalo, Parallel.....new list dis 25 %
Fisher & Norris' Double Screw Parallel.....dis 15&10 %
Trenton Parallel.....dis 15 %
Merrill's Parallel.....dis 15 %
Parker's.....dis 20 %
Stephens' Parallel.....dis 15 @ 20 %
Bonney's Saw Filers.....per doz $20—dis 20 %
Stearn's Saw Filers.....per doz $20—dis 20 %
Wheel Barrows.
Canal (Pugsley & Chapman).....new list dis 12½ %
Coal, Garden and Stone (Pugsley & Chapman).....dis 25 %
Well Wheels.
Revised list.....dis 60&10 %
Wire.
Brass and Copper.....dis 10 %
Bright and Annealed.....Nos. 0 @ 18 dis 40 @ 45 %
" " " 19 @ 26 dis 47½ @ 52½ %
" " " 27 @ 36 dis 52½ @ 57½ %
Coppered.....0 @ 18 dis 35 @ 40 %
Galvanized, Nos. 9 to 9.....₱ ℔ 8½ @ 9c net
Galvanized, Nos. 10 to 18.....market list dis 10 @ 15 %
Tinned.....dis 25 @ 30 %
Cast Steel.....dis 15 @ 20 %
Tinned Broom Wire.....dis 30 @ 35 %
Galvanized Telegraph, Nos. 8 and 9.....₱ ℔ 9c @ 9½c
Galvanized Telegraph, Nos. 10 and 11.....₱ ℔ 10c @ 10½c
" " 12.....₱ ℔ 10½c @ 11c
Annealed Fence. Nos. 8 and 9.....dis 40 @ 45 %
" Grape, " 10 to 14.....dis 40 @ 45 %
Fence Staples.....₱ ℔ 8 @ 8½ %
Stubs' Steel Wire.....$7 00 to $ gold
Judd's Picture Wire.....dis 50
Clothes Line Wire.....per coil 60c. net
Wrenches.
American Adjustable.....dis 45 %
Baxter's Adjustable "S".....dis 20 %
" Diagonal.....dis 20 %
Collins & Co.'s.....dis 45 %
Coes' Genuine.....dis 40&5 %
" Pattern (Wrought).....dis 50&10 %
" " (Malleable).....dis 60&10 %
Lindsay's Patent.....dis 25 %
Taft's Pattern.....dis 20&10 %
Davis Patent Duplex.....new list dis 25 %
Bemis & Call's Patent Combination.....dis 20&5 %
" " Merrick's Pattern.....dis 25&2½ %
" " Brigg's Patent.....dis 15&10 %
Aiken's Pocket.....per doz $10·00—dis 4&10 %

Wringers.

	Less than 2 doz	2 doz lots
Providence	₱ doz $7·00	$70·00
Reliance	₱ doz 69·00	67·00
Universal—Extra	₱ doz 72·00	70·00
Novelty	₱ doz 72·00	70·00
Sherman	₱ doz 72·00	70·00
Wringers without Cog Wheel	₱ doz 58·00	60·00

TIN WARE AND TRIMMINGS.

STAMPED TIN WARE, dis 5 %.
COMMON STAMPED WARE, &c.
Bucket Covers.

Quarts	½	1	2	3	4
Inch	4½	5 3-16	6 5-16	6½	7 11-16
Per gross	$2·00	2·60	3·40	4·25	5·75
Quarts	6	8	10	12	
Inch	8¾	9½	9¾	10 9-16	
Per gross	$6·50	8·00	8·50	11·50	

Cake Box Covers.

	Small.	Medium.	Large.
Inch	11¼	12½	13¾
Per gross	$15·00	18·00	22·00

Pot Covers.

Inch	7⅝	8¼	8⅝	9¼	9⅝	10¼
Per gross	$5·75	6·00	6·25	6·75	7·25	8·25
Inch	10⅜	11¼	11⅝	12¼	12⅝	13¼
Per gross	$8·75	9·50	10·00	13·00	13·75	16·50

Pie, Dinner or Scolloped Plates.

Inch	6	7	8	9	10	11
Per gross	$4·00	4·50	5·50	5·50	8·50	10·50

Deep Pie Plates.

Inch	9	10
Per gross	$8·50	10·50

Jelly Cake Pans.

Inch	9	10
Per gross	$7·50	10·00

Coffee Pot Covers.

Plain	1¼	2	3	4	5	6 qts.
Inch	3	3⅜	3¾	4⅛	5	
Per gross	$1·15	1·40	1·60	2·00	2·75	3·00
Rimmed	2¾	3	3¼	4	4½ inches.	
Per gross	$2·25	2·50	3·00	3·50	4·00	

T. K. Breasts only.

Inch	7¾	8	8½	9	9½	10	10½	11	11½
Per gro.	$6·00	6·50	6·75	7·25	7·75	9·50	10·00	12·00	13·00

Grater Plates.

Sheet	¼	½	1
Per gross	$3·00	6·00	11·50

Scolloped Cake Pans.

	Small.	Large.
Without Tubes	per gross, $6·00	11·50
With Tubes	" 10·50	14·00

Stamped Square Pans.

No.	¼
Per gross	$7·50

Common Square Pans (One Sheet).

Per gross	$11·50

Milk Skimmers (Plain or Pierced).

Per gross	$4·00

Lettered Plates

Inch	5½	6
Per gross	$3·25	4·00

Steamer Bottoms.
Add $1 per gross, or 10c. per doz. to list of Pot Covers.
Tin Stove Pipe Rings.

Inch	4	4½	5	5½	6	7
Plain	per gro. $4·00	4·50	5·00	5·50	6·00	7·00
Jap'd or Burn'd	" 6·00	6·50	7·00	8·00	9·50	10·00

Coffee Boiler Lips.

	Small.	Large.
To Rivet	per gross, $0·80	1·10
To Solder	" 1·25	

STAMPED DEEP AND RETINNNED WARE, dis 20 %.
Plain Stamped Water Dippers.

	½ pint.	Pint.	Quart.	quarts.	2½ quarts.
Per doz	·20	1·15	1·50	1·85	2·50

Retinned Milk Pans.

Qts	1	1½	2	3	4	5	6	8	10	12
₱ doz	1·20	1·50	1·75	2·00	2·25	2·75	3·50	3·85	4·75	5·25	5·75

Dipper Bowls, Plain Stamped—

Pints	½	1	Quarts	1	2	2½
Per doz	·50	·75	Per doz	1·00	1·25	1·75

Dipper Bowls, Retinned—

Pints	½	¾	1	Quarts	1	2	2½
Per doz	·75	·85	1·05	Per doz	1·40	1·75	2·25

Pans.
Dish Pans, Retinned Deep—

Quarts	7	8	10	14	17	21	30
Per doz	8·50	9·50	11·00	13·00	16·00	19·00	30·00

JAPANNED TIN WARE, dis 5 %.

Canisters, Common	Pound	¼	½	1	2	3
	Per gross	$10·50	15·00	24·00	30·00	
Canisters, Hinged	Pound	1	1½	2	3	4
	Per gross	$19·00	25·00	32·00	37·00	42·00

Canisters, Square	Pound	2	4	6	8	12	16
	Per doz	$3·00	4·25	5·00	5·75	8·00	9·00
Candlesticks, Japanned	No.	1	2				
	Per gross	$8·00	7·00				
Cake Boxes, Round	per nest,	$2·25					
Square	per nest,	4·25					
Chamber Pails, Japanned							
Nos	2	3	4	5			
Green, per doz	$8·00	9·00	11·00	13·00			
Oak "	$9·00	11·00	12·00	13·50			
Dust Pans, Corrugated	per gross,	$22·00					
Box Graters	per gross,	$3·75					
Molasses Cups	Pint	½	1	2	4		
	Per gross	$13·00	16·00	28·00	42·00		
Lunch Boxes, per doz	7 in $2·00; 8 in. $2 50						
Pepper Boxes Japanned	₱ gross small, $3·00; large, $4·00						
Toy Banks, House	No.	1	2				
	Per gross	$7·00	5·50				
Toy Banks, Gothic	No. 1. $6·00, No. 2, 4·00 per gross						
Toy Cups, Straight	No.	1	2				
	Per gross	$3·75	3·25	2·75			
Toy Cups, Flaring	No. 1, $4·25; 2, $3·75 ₱ gross						
Toy Pails, Covered	No. 1, per gross $4·00						
Toy Rattles	per gross, $2·00						
Trunks, Wire Handled	per nest (5) $1·75						
Spittoons, Tin	per gross, $27						

PLANISHED TIN WARE, dis 20 %.

Planished Coffee Pots, Round.							
Each	·60	·75	·85	·95	1·15	1·25	1·30	1·40
Pints	1	2	3	4	5	7	8	
Planished Tea Pots, Round.								
Each	·70	·80	·95	1·05	1·25			
Pints	2	3	4	5	6			
Planished Tea Pots, Oval.								
Each	·70	·80	·90	1·05	1·15	1·40	1·75	
Pints	2	3	4	5	6	8		
Planished Pepper Boxes, No. 1	per doz., $1·52							
Planished Flour Dredges, No. 3, $2·10; 4, 2·45 ₱ dozen.								
Planished Round Coffee Biggins.								
Pints	2	3	4	5	6	8		
Each	$1·00	1·10	1·20	1·40	1·60	2·00		
Planished Oval Coffee Biggins.								
Pints	2	3	4	5	6	8		
Each	$1·15	1·25	1·40	1·60	1·80	2·25		
Planished Oval Chafing Dishes, Imperial Covers.								
Inch	10	12	14	16	18	20	22	24
Each	$8·85	5·00	6·25	7·60	9·00	11·50	15·00	16·50
Planished Oval Chafing Dishes, Low Covers.								
Inch	10	12	14	16	18	20		
Each	$3·25	4·35	5·20	6·20	7·80	9·25		
Planished Low Dish Covers.								
Inch	10	11	12	14	16	18	20	
Each	$ ·70	·80	1·00	1·25	1·50	2·00	2·75	
Planished Imperial Dish Covers.								
Inch	10	11	12	14	16	18	20	22	24
Each	$1·55	1·70	2·00	2·60	3·15	3·45	4·00	5·45	6·30
Planished Etnas, on Stands.									
Pints	1½	3	4	5					
Each	$0·90	1·00	1·20	1·50	1·75				
Planished Liquor Mixers	Nos.	0	1	2					
	Per doz	$2·00	2·10	2·45					
Planished Oval Melon Molds.									
Nos	2	3	4	5	6	7	8	9	
Each	$·60	·65	·70	·80	·90	1·00	1·15	1·35	
Planished Oval Tumbler Warmers.									
To fit 1, 2, 3, and 4 O. G. Urns	each, $2·50								
Planished Oval O. G. Urns.									
Nos	0	1	2	3	4	5	6	7	8
Each	$4·90	5·45	6·30	7·00	7·75	9·25	11·25	12·50	15·50
Planished Round Urns.									
Nos	0	1	2	3	4	5	6	7	
Each	$4·20	4·85	5·45	6·30	7·75	9·00	11·00	14·25	
Planished Round Oyster Dishes, (Complete)	Nos.	1	2						
	Each	$2·10	2·80						
Planished Oyster Dish Plates	Nos.	1	2						
	Each	$0·25	0·30						
Oyste Dish Covers	Nos.	1	2						
	Each	$0·30	0·35						

Tea Pot Handles—P. S. & W.....dis 20 %
Stow's Patent Hollow Tea Pot Handles.

No. 1, Small	4½ inches	per gross,	$11·50
No. 2, Medium, 5½	"	"	12·50
No. 3, Large, 6½	"	"	13·50
No. 4, Ex. Large 7½ in., for Wash Pitchers &c.		"	18·00

Solid Iron. Tin Tipped.

No. 10, Small,	4¾ inches	per gross,	$9·00
No. 15, Medium, 5½	"	"	9·50
No. 20, Large, 6½	"	"	10·75

Stow's Patent Hollow Tea Pot Handles, Adamantine
BRONZE—P. S. & W.
No. 12, Bronzed and Tin-Tipped.....per gross, $13·50
Saucepan Handles. Of Best Malleable Iron.
P. S. & W.....dis 20 %
Japanned.

No. 1, 5½ inches long	per gross,	$3·50
No. 2, 6 "	"	3·75
No. 3, 6½ "	"	4·00
No. 4, 7¼ "	"	4·25
No. 5, 8 "	"	4·50
No. 6, 9 "	"	4·75

Tinned.

No. 1, 5½ inches long	per gross,	$4·25
No. 2, 6 "	"	4·50
No. 3, 6½ "	"	4·75
No. 4, 7¼ "	"	5·25
No. 5, 8 "	"	5·50
No. 6, 9 "	"	5·75
Japanned	per lb.,	·16
Tinned	"	·20

Iron Kettle Ears (P., S. & W.).....dis 45 %
Half gross pairs in a package.
Tinned.

Nos	1	2	3	4	5	6	7
Per gross pairs	.85c	$1·00	1·50	1·75	2·10	2·75	3·75	4·50

Black.

Nos	1	2	3	4	5	6	7	8
Per gross pairs	.75c	85c	$1·35	1·50	1·75	2·25	2·75	4·00

Tinned Tea Kettle Ears.

Nos	4	5	6
Per gross pairs	$1·75	2·10	2·75

Extra Heavy Tinned Kettle Ears—French Pattern.

Nos	1	2	3	4	5	6	7
Per gross pairs	1·00	1·25	1·50	1·75	2·00	2·50	3·00

Malleable Iron Kettle Ears for Coal Hods &c.
P., S. & W.....dis 20 %

No. 10 Small	₱ ℔. Tinned	23c;	Black,	16c
No. 20 Medium	₱ ℔, "	23c;	"	16c
No. 30 Large	₱ ℔, "	20c;	"	16c
No. 40 Extra Large	₱ ℔, "	20c;	"	16c

In cases of 100 lbs. each.
Milk Can or Boiler Handles—(P. S. & W.) 4¼ in..dis 25 %
Plain, 8c.; Japn'd, 9c.; Tinned, 15c. per lb.; Malleable Clips or Ears to match, Tinned.....30c per lb.
Toilet Ware Handles—4½ inches (P. S. & W.).....dis 35 %
Plain with drilled holes, per lb.....9c
Plain with Cast " 8c
Plumbers' Scrapers—(P. S. & W.).....dis 25 %
Extra quality, length 6 in., per doz.....$4·00

METALS.

IRON.—DUTY Bars, 1 to 1¼ cents per lb., Sheet, Band, Hoop and Scroll, 1¼ to 1¾ cents per lb. Provided, that none of the above Iron shall pay a less rate of duty than 35 per cent. Pig, $7 per ton; Polished Sheets, 3 cents per lb.; Wrought Scrap, $8 per ton; Cast Scrap, $6 per ton. Railroad, 70 cents per 100 lbs. Boiler and Plate, 1¼ cents per lb.

Pig Iron—AMERICAN.			
Foundry No. 1	₱ ton,	$26 00 @	28 00
Foundry No. 2	"	25 00 @	26 00
Gray Forge	"	23 00 @	25 00
White and Mottled	"	21 00 @	22 00
SCOTCH.			
Coatness	"	31 50 @	32 00
Glengarnock	"	32 50 @	33 00
Gartsherrie	"	31 50 @	33 00
Eglinton	"	30 00 @	31 00
Bar Iron.			
Am. Renned, at mill		2·6c. @	2·8c
Rails.			
Welsh, gold	₱ ton,	48 00 @	50 00
American, at works, currency	"	47 00 @	50 00
Old Rails		26 00 @	26 50
Scrap.			
Wrought Scrap	"	31 00 @	32 00

Bar Iron from Store.
Common Iron.
¾ to 2 in. round and square.....₱ ton $57 50 @ 60 00
1 to 6 in. x ¾ to 1 in.....
Refined Iron.
¾ to 2 in round and square....." 60 00 @ 62 50
1 to 6 in. x ¾ to 1 in.....
1 to 6 in. x ¼ and 5-16....." 65 00 @ 67 50
Shafting Iron—2½ to 4 in....." 70 00 @ 80 00
Rods—3-16 to ⅜ round and square....." 62 50 @ 115 00
Bands....." 75 00 @ 77 50
Hoops—¾ to 2 in....." 85 00 @ 135 00
Swedish Iron.
Ordinary sizes....." 132 50 @ 135 00
Plow size.....

Sheet Iron.

	American and English.	Common American.	R. G. English.	R. G. American.
Nos. 10 to 20	₱ ℔	5c	5c	5¼c
21 to 24	"	4¾c	5¼c	5½c
25 to 26	"	4½c	5¼c	5¾c
27	"	4¾c	5¾c	6c
28	"	5c	5c	6¼c

Galvanized, 14 to 20, prime, ₱ ℔ 9c; 2d quality..₱ ℔ 8c
" 21 to 24 " 9½c " " 8¼c
" 25 to 26 " 10c " " 9c
" 27 " 11c " " 10c
" 28 " 12c " " 11c
Patent Polished.....₱ ℔ 14c
Russia, Nos. 8 to 26.....16½c
" Stained. No. 1.....15½c
Belgian.....10c
One piece Corrugated Sheet Iron Elbows.
CHARCOAL IRON.

⅝	5	5½	6	7 inch.
$3·50	3·50	4·50	5·25	6·50 per doz.

RUSSIA IRON.

4½	5	5½	6	7 inch.
$5·00	7·00	9·50	12·00	14·00 per doz.

COPPER—DUTY. Pig, Bar and Ingot, 5c.; old copper, 4 cents ₱ ℔; MANUFACTURED (including all articles of which copper is a component of chief value) 45 % ad valorem.
American Ingot.....₱ ℔ 23¼ @ 23½c
English " .....
SHEATHING, BRAZIERS COPPER, BOLTS, &C.
Braziers Copper, ordinary sizes, over 16 oz., per square foot.....31c. ₱ ℔
Braziers' Copper, ordinary sizes, 16 oz. and over 12 oz., per square foot.....33c. "
Braziers' Copper. 12 oz. per square foot and lighter..33c. "
Circles less than 24 inch in diameter.....34c ₱ ℔
Circles, 24 inch diameter and over.....37c. "
Segment and Pattern Sheets.....34c. "
Locomotive Fire Box Sheets.....31c. "
Sheathing Copper, over 12 oz. per sq. ft.....30c. "
" 12 oz. ₱ sq. ft. and lighter... 35c. "
Bolt Copper.....31c. "
Copper Bottoms, 35c. ₱ ℔.....net
No Copper in Sheathing except 14x48 inches, and not to exceed 34 oz. to the square foot.

O'NEILL'S PATENT PLANISHED COPPER.

14x48.		
14 and 16 oz. and heavier	35c. By the case,	36c. ₱ ℔
12 oz. and lighter	40c. "	39c. "
Boiler Sizes.		
7 in., 14x52. 8 in., 14x56. 9 in., 14x60		
14 and 16 oz. and heavier	39c. By the case,	38c ₱ ℔
(And all sizes not over 30 inches wide.)		
30x60		
14 and 16 oz. and heavier	41c. ₱ ℔	
12 oz.	44c. "	

TINNING.

14x48, by the case	6c. ₱ sheet
14x48, less than case	8c. "
Other sizes not larger than 30x60	2½c. ₱ sq.
Larger than 30x60	5c. "

LEAD—DUTY: Pig $4 per 100 lbs.; old Lead, 1½ cent per lb.; Pipe and Sheet, 2½ cents per lb.

Spanish	7c gold
German Refined	6½c gold
English	6½ @ 7c gold
American	6 @ 6½c gold
Bar	8½c.
Pipe	9½c.
Tin Lined Pipe	10½c.
Sheet	9½c.
Shot	dis 10 %. Drop, 9½c. Buck, 10½c.

BABBITT METAL.

N. P. U	₱ ℔ 8½ @ 9c
A, 25c.; B, 20c.; C, 15c.; D. 12c. ₱ ℔.	

SOLDER.....No. 1, 15c.; No. 2, 13⅜ @ 14c

STEEL.—DUTY: Bars, Ingots, Sheets and Coils, valued at 7 cents per lb., or under, 2¼ cents; over 7 cents, and not above 11, 3 cents per lb. over 11, 3½ cents per lb, and 10 % ad val. Railway Bars 1¼ cents per lb. Railway Bars, in part Steel, 1 cent per lb. Provided, that Metal cemented, cast or made from Iron by the Bessemer or pneumatic process, of whatever form or description, shall be classed as

American Cast Steel.

Tool	15 @ 16c
Spring	10c
Homogeneous	12½c
Tire	12½ @ 13½c
Machinery (round and square)	10 @ 11c
File	11c
Sheet	14 @ 16c
Saw Plate, mill and mulay	14 @ 16½c
Saw Plate, gang and X cut	13 @ 14c
" circular as to size	18 @ 30c

Chrome Steel.

Tool	₱ ℔ 20 @ 21c
Tool, extra fine	" 40 @ 75c
Spring	₱ ℔ 12c and upward
Machinery	₱ ℔ 11c
Hammer	" 15c.
Gun or Homogeneous	" 16c

English Steel, payable in gold, net.

"	Best Cast	₱ ℔ 17¾c
"	Extra Cast	" 18½c
"	Round Machinery, Cast	₱ ℔ 10¼ @ 11½c
"	Swaged, Cast	" 19½c
"	Best Double Shear	" 17¾c
"	Blister, 1st quality	" 14½c
"	" 2d quality	" 13 c
German Steel, Best		" 11½c
do	2d quality	" 10¾c
	3d quality	" 9½c
Sheet Cast Steel, 1st quality		" 11¾c
" "	2d quality	" 11½c
" "	3d quality	" 12½c
File Steel, Flat and ½ Round		" 12½c
" Square and Round		" 12½c
" Mill		" 13½c
" Taper to 4 inch		" 16c
" Taper 3 and 3¼ inch		" 18c

SPELTER—DUTY: In Pigs, Bars and Plates, $1 50 per 100 lbs.

Silesian, cash	6¾ @ 7c., gold
American "	7¾ @ 11c., currency

TIN—DUTY: Plates, Sheets, Tagger and Terne, 1·1c per lb.; Electro-galvanized Plates, 2 cents per ℔; Manufactures of, not enumerated, 35 per cent. ad val. Bars, Block and Pigs, free. Banca, subject to duty of 10 per cent.

Banca	₱ ℔ 23½ @ 24c., gold
Straits	₱ ℔ 19 @ 20c., gold
English	₱ ℔ 19 @ 20c., gold

CHARCOAL TIN PLATE.

I C	10x14, Prime Charcoal	10·00
	12x12, "	10·50
	14x20, "	10·75
I X	10x14, "	12·25
	12x12, "	12·75
	14x20, "	13·25
D C	12½x17 "	9·50
D X	12½x17 "	11·75
For each additional X add		2·25

COKE TIN PLATE.

	Best	2d Quality.	Ordinary.
I C 10x14	$ 9·25 @ 9·75	8·25 @ 9·00	8·00 @ 8·50
I C 12x12	9·75 @ 10·00	9·00 @ 9·25	
I C 14x20	9·75 @ 10·00	9·00 @ 9·50	8·00 @ 8·25

TERNE PLATE.

	Prime Char.	2d qual.	Coke.
I C 14x20	$ 9·00	8·50 @ 9·00	8·00 @ 8·25
I X 14x20	11·00		
I C 20x28	19·00	17·00 @ 18·00	16·50
I X 20x28	24·00 @ 24·50		
I C 20x20	23·25 @ 23·50		

ZINC.—DUTY: Pig or Block, $1 50 per 100 lbs. Sheet 2¼c. ₱ ℔.

Sheet	cask 10¼c
"	open 10½c

Old Metals.

(*Dealers' Selling Price.*)

Copper	@ 20
Yellow metal	14 @ 15
Brass	13 @ 14
Heavy Composition	17 @ 18
Old lead, solid	6 @ 6¼
Tea lead	5
Wrought iron	1½ @
Sheet iron	0¾ @ 0¾
Cast iron	¾
Machinery iron	1¼ @ 1
Zinc	5 @ 5¼
Pewter, No. 1	17
" No. 2	10 @ 12
Spelter	5 @

Paints, Oils, etc.

Paints.

Black, lamp—Coach Painters	₱ ℔ 20c
" " Ordinary	6c
" Ivory Drop, fair	15c
" " best	26c
Black Paint, in oil	kegs, 8c.; asst'd cans, 11 c
Blue, Prussian, fair to best	50 @ 75c
" " " in oil	35 @ 65c
" Chinese, dry	32c
" Ultramarine	25 @ 30c
Brown, Spanish	1¼c
" Van Dyke	8c
Carmine, 40	$12 00
Green, Chrome	15 @ 23c
" " in oil	18 @ 25c
" Paris	good, 30c; best, 40c
" " in oil	" 30c " 45c
Mineral Paints	1¼ @ 4c
Orange Mineral	14c
Red Lead, American	9¼c
" English	10½c
" Venetian (N. C.) dry	2¾c
" " in oil	asst'd cans, 11c; kegs, 8½c
" Indian, dry	10c
Rose Pink	18c
Sienna, American, Raw	4c
" Burnt	4½c
" " in oil	16 @ 20c
" Raw "	15 @ 25c
Umber, Burnt	4 @ 8c
" " in oil	16 @ 21c
" Raw	3½ @ 7½c
" " in oil	16 @ 22c
Vermillion, Chinese	
" English	1 10, gold
" Trieste	1 10 "
" American, Common	23c
White Lead, American, pure dry	10c
" " in oil	11c
White, Paris, English, prime	in bbls. 2½ @ 3¼c
Yellow Ochre, French	2½ @ 2¾c
" " in oil	asst'd cans, 11c; kegs, 8½c
" " Vermont	in casks 1¼c
" " Chrome	17 @ 27c
" " in oil	16 @ 28c
Zinc White, American No. 1 dry	9c
" " 1, in oil	11c
" French (Paris)	11c
" " in oil	12c

Oils.

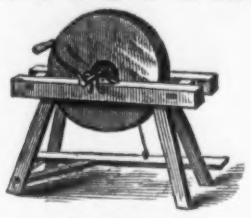
Linseed Raw	₱ gal. casks, 60c. bbl., 61c
" Boiled	63c. " 66c
Whale, Crude	"
" Bleached Winter	" 75c
Sperm, Crude	" 1·65
" Winter unbleached	" 1·90
" " Bleached	" 2 00
Seal, Extra Refined	"
Lard, Pure Winter	" 1·30
" Spring	" 1·20
Cotton Seed, Crude	" 60c
" Southern Yellow	" 65c
" White	"
Neatsfoot, Winter	70c @ $1·10
Natural Lubricating	38c @ 40c

Sundries.

Asphaltum	5c
Benzine	₱ gal. 16c
Chalk	1½c
" Block	
Dryer, Patent, Am'n	asst'd cans, 10½c.; kegs, 9c
" English	" 11c.; " 9c
Flocks	
Frostings	50c
Glue, White	33 @ 47c
" Sheet	20c
Glaziers' Points, Zinc	9c
Gum, Copal	35c
" Damar

Grindstones, Emery, &c.

Walter R. Wood,
GRINDSTONES.



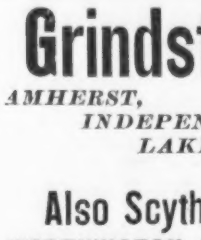
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WOODEN TOOTH



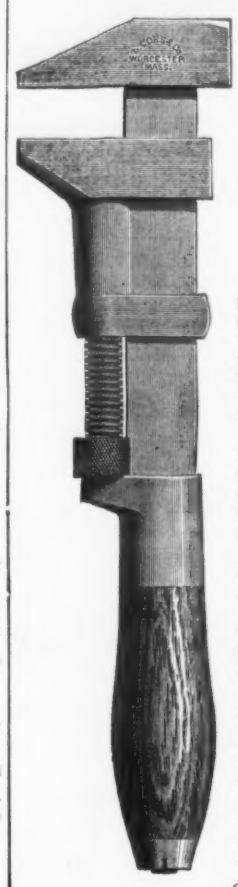
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The Best yet Invented.
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GEORGE FOCHT,
Iron Foundry, Machine & Sheet Iron Works,
First and Adams Streets, Hoboken, N. J.



Inventor, Patentee and Manufacturer of the Celebrated Self-dumping Hoisting Tubs, Iron, Coal Cars, side or bottom dumping, Iron Dock and Hook Blocks, Iron Sheaves, with or without Steel Friction Rollers for Chain, Wire or Hemp Rope, of every size and description Iron Box Wheelbarrows, Coal and Coke Barrows, Charging Scoops, etc., for Gas Works, and Sheet Iron Work in general. Improved Mast Shoe and Gaft Socket Castings, and complete Iron Work for Mast and Gaft made to order and put up if desired. Machinery, Building and other Castings on hand and made to order. Illustrated Circular and Price List sent on application.

L. COES'
Genuine Improved Patent
SCREW WRENCHES.



Manufactured by
L. COES & CO.,
Worcester, Mass.

Established  in 1839.
Registered March 31, 1874.

We invite the particular attention of the trade to our New Straight Bar Wrench, *widened*, full size of the larger part of the so called "reinforced or jog bar." Also our enlarged jaw, made with ribs on the inside, having a full bearing on the front of bar (see sectional view), making the jaw fully equal to *any* strain the bar may be subjected to.

These recent improvements in combination with the nut inside the ferrule firmly screwed up flush, against square, solid bearings (that cannot be forced out of place by use), verifies our claim that we are manufacturing the strongest Wrench in the market.

We would also call attention to the *fact*, that in 1869 we made several *important* improvements (secured by patents), on the old wrench previously manufactured by L. & A. G. Coes which were *at once closely* imitated and sold as the *Genuine* Wrench by certain parties who seem to rely upon *our* improvements to keep up their reputation as manufacturers, and although the fact of their imitating our goods may be *good* evidence that we manufacture a superior Wrench, we wish the trade *may not be deceived* on the question of *originality*. Trusting the trade will fully appreciate our *recent* efforts, both in improvements on the Wrench and in the adoption of a Trade Mark, we would caution them against imitations. None genuine unless stamped

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Every Calk warranted to Harden.
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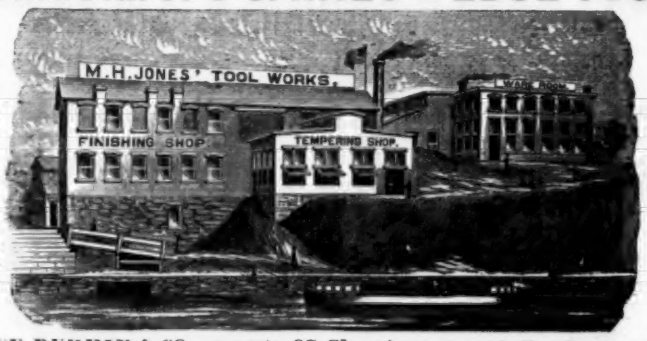
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In calling the attention of the trade to our new Toe Calks, would say that they are **Strictly Forged,** and are made of the best metal, which we have adopted after careful experiment, as the most reliable for this particular use. These Calks commend themselves to all practical horseshoers, as being the **Original Shape** they are all familiar with, and at the same time effectually obviate the stereotyped complaints against the two prong Calks in weakening the toe of the shoe where strength is most needed.

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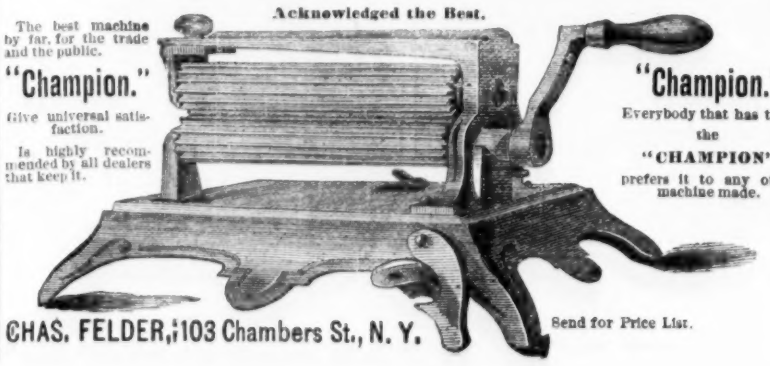
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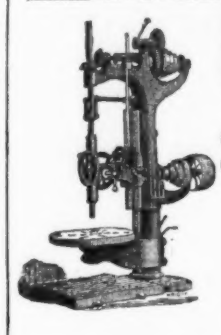
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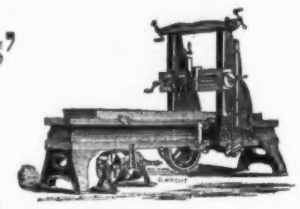
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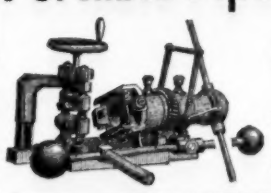
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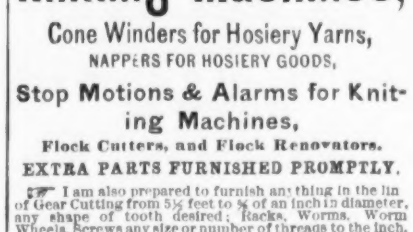
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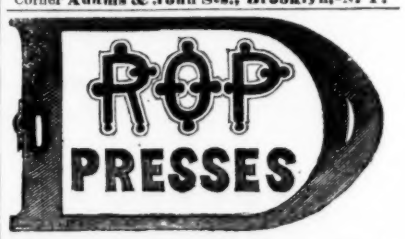
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Second.—No dog is used on the upright to hold up the hammer. The belt or board passes up between two clamps located under the rolls, so arranged that as the handle swings is they will freely open of themselves, but on the striking they will close and hold up the hammer. To let the hammer fall the clamps are opened by pressure upon the foot treadle.

Third.—The board or belt is secured to the hammer by an elastic connection, which prevents the sudden jar and destruction of the same. The back roll is made adjustable to different thicknesses of board or belt, as also are the clamps. An adjustable collar on the upright rod allows the operator to obtain *any hight* of blow desired automatically. If one blow is wanted, press upon the treadle and remove the pressure as soon as the blow is given. Keep the foot upon the treadle and the blows will be repeated until the pressure is removed. If a blow of less hight than the collar is set for is required work the hand lever, which will give you any hight of blow desired. The hammer can be held up at any point below the collar by bringing the hand lever into action when the hammer is at the desired hight, so that the next blow can be given from a state of rest, of less hight than the collar is set for. This is a feature no other drop has; that is, the first blow struck can be of less hight than the second or third, and obtained from a state of rest. A gentle pressure upon the treadle will allow the hammer to go down slowly, but it will stop and remain suspended at any point as soon as the pressure is removed.

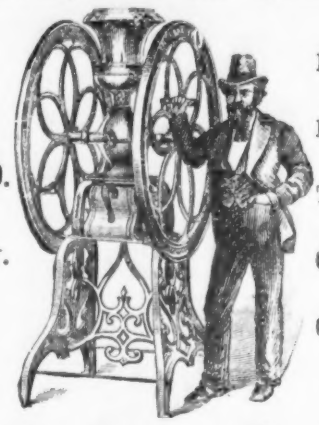
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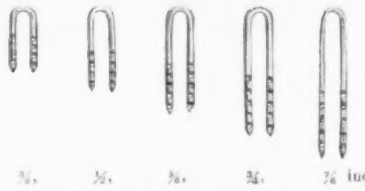
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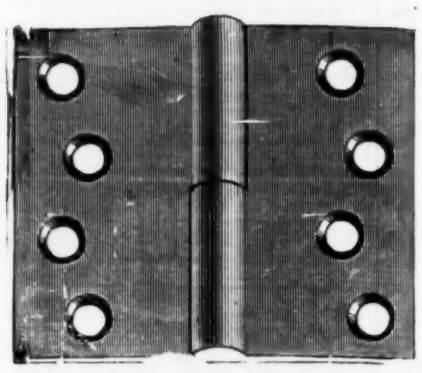


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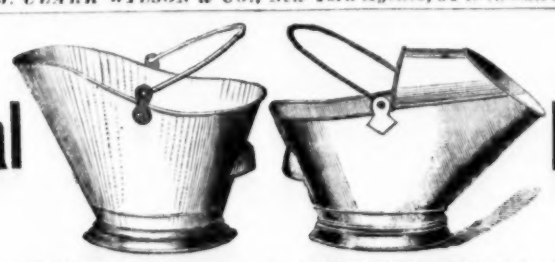


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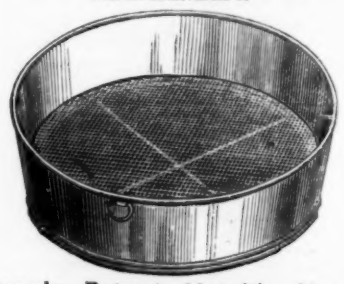
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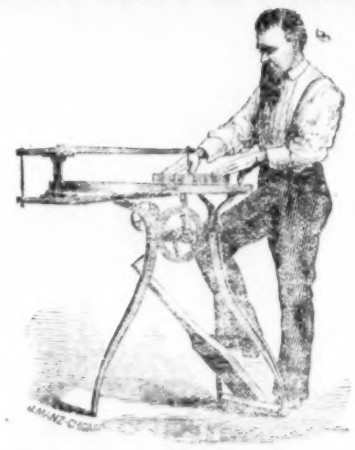


Mann's Patent Metallic Sieve,
24 South Commercial St., St. Louis, Mo.
The best sieve in use. To be had of all dealers.
A full assortment of these goods kept in stock at 88 Chambers Street, N. Y.
GRAHAM & HAINES, Sole Agents

FLUTING MACHINES.
The Celebrated K. F. M.
Manufactured for the Trade by
HENRY SOMMER.
8 to 12 Pearl Street, NEWARK, N. J.

Established in 1836.
Shelton Company,
Manufacturers of every variety of
TACKS & SMALL NAILS,
Carriage, Machine, Plow, Stove and Tire Bolts, Coach Screws, Bed Screws, &c.
BIRMINGHAM, CONN

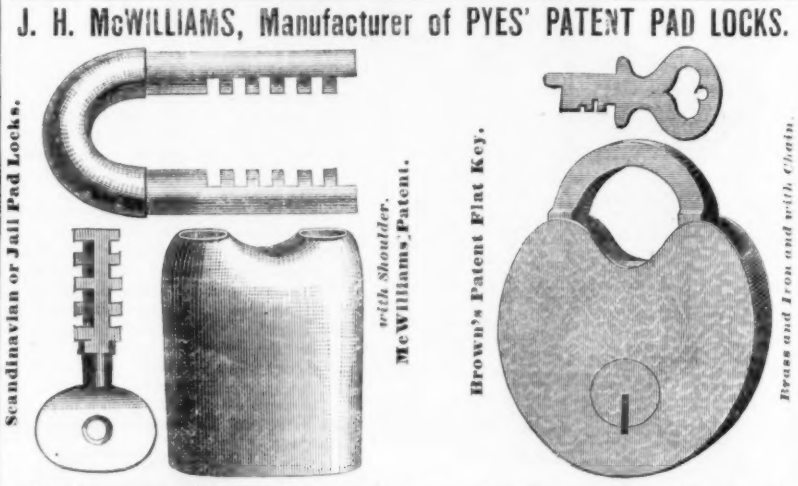
BARNES' FOOT POWER
Scroll Saws & Lathes.



Send for Catalogue. Terms net cash.
M. D. CONVERSE & CO.,
68 Park Place, N. Y.

QUACKENBUSH, TOWNSEND & CO.,
Hardware, Cutlery, &c.
59 & 61 Reade Street, N. Y.
Depot for THOS. JOWITT & SONS, (Sheffield, England,) FILES and HORSE RASPS.
Rough & Ready And CLIPPER SCYTHES, Warranted.
Manufacturers of the
CHALLENGE DOOR & GATE SPRING.
PATENTED JULY 11TH 1871.
Patented March 4, 1873.
Agents for
Norwich Lock MFG. CO.
"BEAVER" (American) FILES and HORSE RASPS.
"WIDE AWAKE" AXES.

J. H. McWILLIAMS, Manufacturer of PYES' PATENT PAD LOCKS.



Scandinavian or Jail Pad Locks.
with Shoulder.
McWilliams' Patent.
Brown's Patent Flat Key.
Brass and Iron and with Chain.

JOHN J. TOWER, Sole Agent, 96 Chambers St, N. Y.



Tredegar Horse and Mule Shoes.
These superior Shoes are made of the Best Virginia Charcoal Iron. They are well adapted to Western and Southern demand, and are shipped to all prominent markets at freights as low as other makes.
THE TREDEGAR COMPANY, Manufacturers,
Tredegar Iron Works, Richmond, Va.
SEMPLE, BIRGE & CO., Sole Western Agents, ST. LOUIS, MO.



BUCK BROTHERS, Millbury, Mass.
The most complete assortment in the U. S. of Shank, Socket Firmer, and Socket Framing Chisels,
PLANE IRONS.
Gouges of all lengths, and circles beveled inside or outside. Nail Sets, Scratch and Belt Awls, Chisel Handles of all kinds. Orders filled promptly; generally same day as received.

PHILADELPHIA.

(Corrected weekly by Lloyd, Supplee & Walton).

Terms, 30 days. For 60 or 90 days, interest added at 6 per cent. per annum.

Anvils.—Solid Cast Steel.....₱ ℔ 14c
Peter Wright's, (Advanced April 1st.)₱ ℔, gold, 11½c
Wilkinson s..... " 11c
Eagle.....hst 1i cents—dis 30 @ 20&10 %
Apple Parers.—Union.....per doz $7 50
Skeleton..... " 7 50
Victor..... " 7 75
Domestic..... " 7 75
Reading..... " 7 75
Bay State Paring, Coring and Slicing..... " 12 00
" " Peach Parers..... " 10 50
Axes.—Mann's Light.....Per doz. $12 00 @ 11 50
Hunt's Light..... " 14 00 @ 12 50
Red Indian, all sizes..... " 12 00 @ 11 50
Red Chiertain, all sizes..... " 12 50 @ 12 00
Crown Prince..... " 12 50 @ 12 00
Augers and Auger Bits.—Pierce's Pat. Twist Bits.....dis 30 %
Douglass' & Ives' Bits.....dis 40&10 %
Connecticut Valley Auger Bits.....dis 40&10 %
Cook s Bits.....dis 40 10&10 %
Jennings' Bits.....dis 10 %
Bates' Nut Augers.....dis 40&10 %
Douglass' & Ives' Augers.....dis 40&10 %
Watrous' Ship Augers.....dis 10&15 %
Bonney's Pat. Hollow Augers.....dis 25 %
Stearns' Patent Hollow Augers.....dis 25 %
Balances.—
Landers, Frary & Clark's... } Sold on Morton's new
Morton's... } List.....dis 50 %
Chattillon s... }
Common Spring with Hook..... ₱ doz $1 38 @ 2 00
Bells.—Jervin Bros. Mfg Co. Light Hand Bells.....dis 70 %
Common (Tissue Paper Weight).....dis 70&10 %
Swiss Pattern Hand Bells.....dis 50 %
Connell's Door Bells.....dis 50&5 @ 50&10 %
Gt. Western & kentucky Cow..dis 50&10 @ 50 10&5 %
Boring Machines.—Bates' Mfg. Co., complete with augers.....dis 20 @ 25 %
Douglas Mfg. Co., complete with augers..dis 20 @ 25 %
Common Boring Machines, no Augers.....$4 00 @ 3 75
Angular " ..... 5 00 @ 4 75
Bolts.—Eastern Carriage Bolts .....special prices
Western " "
Philadelphia " "
" Eagle, (Coleman's).....dis 60 %
Wrought Snutter, Stanley.....dis 50 @ 50&10 %
Braces.—Barber s.....dis 40&5 %
Backus.....dis50 %
Bartholomew s American Ball.....dis 10&10 @ 15&10 %
Spofford.....dis 50 %
Butts.—Cast Fast Joint, Narrow...dis 25&10 @ 30&10 %
" " Broad.....dis 35&10 @ 40&10 %
Cast Fast Loose Joint.....dis 45&10 @ 50&10 %
" Acorn, Loose Pin.....dis 4 0&10 @ 45&10 %
" Mayers & Parliament.....dis 35&10 @ 40&10 %
" Acorn Jap'd.....dis 40&10 @ 45&10 %
Wrought Loose Pin.....dis 35&10 %
" Table Hinges and Back Flaps.....dis 30&10 %
" Narrow.....dis 30&10 %
" Loose Joint.....dis 35&10 %
Parker's Blind Butts.... } Discount 50&10 % by the case
Sheperd s " .... } 60 %.
Garretson's " .... }
Clark's " .... }
Lull & Porter's " .... }
Garretson's Blind Butts Light No. 0.... } Discount 60 %
" " Lull & Porter Pattern } By the case
Cherrytree Blind Butts } 60&10 %
Chains.—German Hatter.....dis 30 %
" Coil.....dis 20 %
Galvanized Pump..... net 13 @ 13½c
Best Proof Coil Chain—

₱ ℔..	14	10¾	9¼	9	8¾	8½	8c gold
	5-16	¼	5-16	⅜	7-16	½	⅝ in.

By the cask, 560 lbs., ½c per lb. less Common Chain, ½c per lb. less.
Chisels.—Socket Framing.....dis 60 @ 60&10 %
Socket Firmer.....dis 60 @ 60&10 %
Tang " .....dis 40&10 @ 50 %
Beaty s Framing and Firmer.....dis 2 %
Casters.—Iron Bed.....dis 30&10 @ 40 %
Porcelain Wheel Bed.....dis 30&10 @ 40 %
Iron and Brass Wheel Plate.....dis 40 @ 40&10 %
Porcelain Wheel " .....dis 50 @ 50&10 %
Clothes Wringers.—Universa.....per doz $64 00
Novelty..... " 64 00
Discount on 2 dozen lots, $2 per dozen.
Coffee Mills.—Common Box and Side.....dis 15 %
Patent Box and Side.....dis 15 %
Cutlery.—American Pocket (best).....dis 25 %
Landers, Frary & Clark, J. Russell & Co. and Lamson & Goodnow Mfg. Co. Manufacturers' net prices
Drawing Knives.—Hart Mfg. Co. s.....dis 60 %
Adjustable Handle.....dis 10 @ 15 %
Beatty.....dis 15 @ 20 %
Fry Pans.
Tinned.....dis 40 @ 45 %

₱ doz..$3 50	4 00	4 50	5 00	5 50	6 50	7 50	9 00	10 00
No..... 0	1	2	3	4	5	6	7	8

Burnished.....dis 40 @ 45 %

₱ doz..$3 00	3 75	4 25	4 75	5 25	6 00	7 00	8 00	9 00
No..... 0	1	2	3	4	5	6	7	8

Files.
Nicholson Mill Files.....new list
" Bastard..... "
" Taper..... "
Butcher's Mill (Advanced March 8th)...$5 25 to £ gold
" Bastard..... 5 25 to £ gold
" Taper..... 5 25 to £ gold
Fluting Machines.
K. F. M.—4¼ in. rolls, $5 50.....dis 15 %
" —6 in. rolls, $6 50.....dis 15 %
Mrs Knox—4 in. rolls, $5 75.....dis 20 %
" —6 in. rolls, 7 00.....dis 20 %
Hammers.
Yerkes & Plumb's.....dis 15 %
Hammond & Son's.....dis 15 %
Veree.....dis 20 %
Hatchets.
Beatty's.....dis 15 @ 20 %

Shingling and Half. { ₱ doz.	$7 00	7 50	7 75	8 00
{ No.....	1	2	3	

Yerkes & Plumb.....dis 15 %

Shingling and Half. { ₱ doz.	$7 00	7 50	8 00	8 50
{ No.....	1	2	3	4
Claw.... { ₱ doz.	$7 50	8 00		
{ No.....	1	2		3

Hinges.
Strap and T, (Changed March 24).....dis 45 %
Horse Nails.

	Nos.	6	7	8	9	10
Ausable		37	35	24	28	32
Globe		28	26	25	24	23
Brundage		26	24	23	22	21
	Nos.	5	6	7	8	9	10
Putnam		32	28	26	25	24	23

On Ausable, Globe and Brundage 1000 ℔ lots.....dis 5 %
Knobs.—Door, Mortise and Rim.
Makes in Combination.....new list dis 45&5 %
Extra discount for cash 2 %
Mineral and Rim.....dis 5 %
Locks and Latches.—Rim and Mortise.....dis 45&5 %
Extra discount for cash 2 %
Till and Cupboard.....dis 25 %
American Padlocks.....dis 50 %
Scandinavian Pad Locks.

₱ doz.....	$10 50	10 50	12 00	12 00	15 00	15 00	} dis 15 %
No.....	9	9¾	10	10½	11	11½	
₱ doz.....	$18 00		18 00		20 00	22 00	} dis 15 %
No.....	12		12½		13	13½	

Trunk Locks.....dis 5 @ 10 %
Thumb and Roggens Latches.....dis 25 %
Lanterns.—Square Candle and Oil.....dis 10 %
Globe for Oil.....dis 10 %
" Kerosene.....dis 10 %
Tubular Lanterns.....dis 10 %
Mattocks.—Long and Short Cutter.....dis 25 %
Western Pattern.....dis 25 %
Pennsylvania Pattern.....dis 15 %
Molasses Gates.
Enterprise Mfg. Co.'s Measuring Faucets.....dis 20 %
Stebbins' Gates.....dis 60&10 @ 65&10 %
Lincoln's " .....dis 40&10 @ 50 %
Landers, Frary & Clark's Petroleum.....dis 15&10 %
Taylor's Petroleum Faucets.....dis 20&10 %
Brass Liquor Cocks.....dis 20&10 %
Meat Cutters.—Dixon's.....dis 15 %
Woodruff.....dis 15 %
Stowe.....dis 15 %
Hale's.....dis 25 %
Stuffers.....dis 10 %
Planes.—Auburn Tool Co., "Bench".....dis 40 %
Second Quality.....dis 50 %
Metallic Plane Co.....dis 25&5 %
Evans Pat. Circular.....net
Plumbs and Levels.
Adjustable.....dis 60&10 %
Non-Adjustable.....dis 60, 10&10 %
Plane Irons.—American.....list net
Butcher's.....gold £, $5 50
Picks.—Philadelphia.....net
Pittsburgh.....net
Rules.....dis 60, 10&10 @ 70 %
Rakes.—Cast Steel Garden.....dis 40 @ 40&5 %
Malleable Garden.....dis 40 @ 40&5 %
Wood Head Iron Teeth.....dis 40 %
Steelyards.—American Pattern.....dis 15 %

₱ doz....	$5 50	7 00	9 00	10 00	11 00	12 00
No.....	50	100	150	200	250	300

English Pattern.....dis 15 %

₱ doz.....	$7 00	8 67	10 67	12 67	14 67	16 67
No.....	50	100	150	200	250	300

L. F. & C. Excelsior.....dis 10 %

₱ doz.....	$9 00	10 00	12 00	15 00	18 00	21 00
No.....	50	100	150	200	250	300

Scythes.—Golden Clipper, Damascus Blade. Boxed and Sharpened.....₱ doz. $10 00 net
Golden Clipper No. 10, Boxed and Sharpened.....₱ doz $9 75 net
Green Clipper No. 5, Boxed and Sharpened.....₱ doz $9 50 net
Common Scythes.....₱ doz $7 50 @ 9 00
Squares.—Steel and Iron, new list.....dis 50 %
Saws.—Disston's Cross Cut.....dis 15 %
Disston's Hand.....dis 12½ %
W. McNiece s H'd, Cross-Cut & Circ'r, new list..dis 15 %
Boynton's Lightning, new list.....dis 40 %
" Champion.....dis 45 %
Shovels and Spades.
Rowland's Plain Back, Jan. 23d.....dis 25 %
" Back Strap " .....dis 25 %
Oliver Ames & Sons.....new list dis 12½ %
Brady Shovel Co.....dis 12½&2½ %
Sad Irons.—Richmond (polished face).....per lb. 3¾c
Richmond (polished face)..... by the cask " 3¼c
Stone.—Arkansas Oil, No. 1.....₱ ℔ $1 38
Turkey Oil, No. 1..... " 1 00
Washita Extra..... " 30c
" No. 1..... " 22c
" " 2..... " 18c
..... " 5½c

Screws.—Iron.....new list, April 1st, 1875, dis 62½ %
Brass.....dis 52½ %
Spoons.—
Plated.....dis 40&10 @ 50 %
Britannia, Boardmans (new list).....dis 50&10 %
" Parkers (old list).....dis 50 %
German Silver.....dis 30 %
" Light.....new list dis 35 %
Lalance & Grosjean Iron.....dis 10 %
Springs.—Gray's Door.....dis 50 @ 50&10 %
Torry's Door.....dis 50 @ 50&10%
Stocks and Dies......dis 10&5 %
Stove Polish.—Gem.....₱ gross, $5 00
Onyx..... " $5 00
Try Squares.—Winterbottom.....dis 10 @ 15 %
Stanley Rule and Level Co.....dis 45&10 %
Willis Thrall, No. 2.....dis 30&10 %
Disston's No. 2.....dis 40 %
Tacks, &c.—Half Weight Tacks.....dis 72½ %
" " by the case...dis 72½&7½ %
Clout and Finishing Nails.....7½ %
" " by the case.....dis 7½ %
Traps.—Genuine Oneida—Newhouse list.....dis 20 %
Imitation " " " .....dis 30 %
Vises.—Solid Box, currency.....₱ ℔ net 14c
Wrenches.—Coes Genuine.....dis 40 @ 40&5 %
Coes Imitation Wrought Bar.....dis 50&50&10 %
" " Malleable Bar.....dis 60&10 %
" " (Kellogg) Malleable Bar.....dis 65&10 %
Tafts Pattern (Wrought Bar).....dis 70 @ 70&10 %
Philadelphia Tool Co.'s Pat. Duplex.....dis 25 %
" " Improved Baxter.....dis 25 %
" " Adjustable Fork.....dis 25 %
Wire.—No. 0 to 18.....(Advanced April 24th)....dis 40 %
No. 19 to 26..... " .....dis 47½ %
No. 27 to 36..... " .....dis 52½ %
Coppered 0 to 12.....dis 15 @ 20 %
Tinned Broom Wire.....dis 25 %
Galvanized Wire No. 1 to 18.....dis 40 %

BUFFALO.

Reported by Messrs. Sidney Shepard & Co.

July 24, 1875.

Augers—Snell Mfg. Co.....dis 25 %
Axes—Francis.....10&25 @ 10&75
Bits, Auger—Snell Mfg. Co.....dis 25 %
Phœnix.....dis 40 %
Bells, Cow—Saw & Genuine.....dis 30 %
Braces—Bit, Spofford's Patent.....dis 30 %
Brads, Cut.....dis 50 %
Boards—Stove, Brooks' Pat. dis 35 & 4 mos.; 35&5 % 30 dys
Butts—Brass.....dis 30 %
Wrought Narrow.....dis 30 %
" Broad, Loose Joint.....dis 35 %
" Table and Back Flaps.....dis 30 %
Wrought Butts, Loose Pin.....dis 35 %
Belting—Rubber.....dis 30 @ 10 %
Leather, new list, oak tanned.....dis 20 %
Brick—Bath (box of 2 doz) Best English.....$1 25
" Rutherford.....$1 00
Can Openers—Sprague's.....dis 50 %
Cases—Parlor Coal Hod.....dis 15 %
Chalk—White, Carpenter s.....₱ gross, 57c
Red, Carpenter's..... " 90c
Blue..... " $1 00
Chisels—Firmer Socket.....dis 60, 10&10 %
Framing Socket.....dis 60, 10&10 %
Corner Socket Chisels.....dis 60, 10&10 %
Slick's Carpenters'.....dis 60, 10&10 %
Castings—Malleable.....₱ ℔ 10c
Egg Beaters—"Peerless".....per doz $3 60
"Centripetal".....per doz 5 00
Elbows—Corrugated.....3 | 5½ | 6 | 7
Charcoal.....$3 50 | 4 50 | 5 25 | 6 50 } dis 10 %
Russia.....7 00 | 9 50 | 12 00 | 14 00
Files—Maischoss Bros.....dis 50 %
Fluters—Geneva Hand.....₱ doz. $15 00
Freezers Ice Cream—"Champion".....dis 33⅓ %
Hammers—Henry W. Kip's.....dis 10 %
Hinges, Gate—Shepard's.....dis 40&10 %
Hinges—Window Blind—
Sheperd s and Standard.....dis 60&10 %
Wrought Strap and T.....dis 33⅓&10&5 %
Hods, Coal—Plain, Black and Galvan'd...new list dis 15 %
Funnel, Black and Galvanized..... " dis 15 %
Fancy and Helmet..... " dis 15 %
Sad Irons.....3¼c
Kettles—Brass.....₱ ℔. 43c
Copper, "Hand Made".....36c. @ 40c.
Enameled.....dis 50&10 %
Knives, Drawing—Oval No. 1.....dis 60, 10&10 %
Razor Blade.....dis 60&10 %
Lanterns "Peerless." No. 1 | 10
₱ doz $25 00 | $10 50 | $13 75 dis 10 %
Tuouiar..... $11 00
" with Guards..... 11 50
Machines—Apple Paring, "Keystone".....7 75 ₱ doz
Machines—Boring, Snell's.....dis 20 %
Machines—Fluting, Knox.....4 in., $4 00; 6 in., $4 50
Mills, Coffee—Box and Slide, common.....dis 15 %
Box Union and Eagle.....dis 15 %
" American.....dis 20 %
Molasses Gates—"Self Measuring".....dis 20 %
Nails—Clout and Finishing.....dis 7½ %
Shoe.....dis 7½ %
Horse, Ausable.....No. 5 | 7 | 8 | 9 | 10
30 | 27 | 25 | 24 | 22c
" " Pointed & Polished.....add 1c ₱ ℔
" " 1000 lbs.....dis 5 %
" Clinton.....No. 6 | 7 | 8 | 9 | 10
21 | 19 | 18 | 17 | 16c
Packing—Rubber.....dis 30 @ 10 %
Paint—White Lead, U. S. Gov't.....₱ ℔ 8½c
Pans—Dripping.....₱ ℔ 10c
Rivets—Iron, Black and Tinned.....dis 25&7½ %
Screws—"American Screw Co"—
Flat Head, Iron.....dis 62½ %
Flat Head, Brass.....dis 52½ %
Skates and Straps—White's.....dis 20 %
Spoons, Iron Tinned.....dis 10 %
" by the case.....dis 20 %
Plated Rogers' A No. 1.....dis 50 %
Britannia.....dis 50&10 %
Squares—Steel and Iron.....new list, 50 %
Scales—Buffalo Scale Works.....dis 25 %
Fairbanks.....dis 15 %
Stove Polish—Gem.....₱ gross, $4 50
" Dixon's.....$6 00
Tacks—Half Weight Am. Iron.....dis 72½&7½ %
Vases—Palace Coal.....dis 15 %
Vises—
Parallel, Buffalo...Old pattern, dis. 30 %; new, do.dis 20 %
Ware—French, Tinned Iron.....dis 20 %
Stamped and Japanned.....dis 5 %
Cast Iron Hollow.....dis 40 %
Wire—Bessemer Steel.....dis 10 %

Tin Plates.—Add for each X.....2·50

10x14, IC. Charcoal	$10 00	14x20 C. terne	$9 00
12x12, "	10 50	20x28 C. "	20 00
12½x17, "	9 50	20x28 X. "	25 00
14x20, "	11 00		

Pig Tin—Straits.....24c @ 25c
Bar Tin.....26c
Solder—No. 1, Crook's.....16 c
Sheet Zinc—
"Lasalle".....570 ℔ casks $11 00 | 600 ℔ casks 11 50 ₱ 100 ℔s
Sheets.....$11 00
Babbitt Metal.....₱ ℔ 12c
Iron Wire—Bright and Annealed.....dis 45 %
Coppered.....dis 40 %
Tinned.....dis 25 %
Tinned Broom, { Nos. 20 | 21 | 22 | } dis 30 %
{ 20c | 21c | 21c | }
Copper—Sheathing 14 @ 18 oz.....₱ ℔ 30c
Planished.....₱ ℔ 37c @ 39c
Bottoms.....₱ ℔ 33c
Bolts.....₱ ℔ 31 @ 33c
Braziers' Sheets.....₱ ℔ 31 @ 33c
Sheet Iron.—
18 Common.....$4 30
24 Common.....4 50
24 W. D. Wood & Co., Smooth Finish.....5 00
Am. Russia.....A. 14c | B. 11c
Gen. Russia, No. 1 stained.....16½c
" " clean.....15½c
Galvanized.....dis 30 %

CINCINNATI.

Reported by Sellew & Co., Importers and Jobbers Metals, No. 214, 216 and 218 Main street.

Tin Plate.—I. C. 10x14 Charcoal.....$12 00 @ 13 00
I. X. 10x14 Charcoal.....14 50 @ 15 00
I. C. Terne 14x20.....10 50 @ 12 50
I. C. Terne 20x28.....22 00 @ 25 00
I. C. Continuous.....23 00
Black Tin.—
Pig.....₱ ℔ 28c
Bars.....₱ ℔ 31c
Solder.—
A 1.....₱ ℔ 18c
Roofing.....₱ ℔ 17c
S. & Co.....₱ ℔ 23c
Lead.—Pig.....₱ ℔ 7½c.
Bar.....₱ ℔ 8½c
Copper.—
Ingot.....₱ ℔ @ 24c
Planished..... " @ 59c
Sheathing..... " @ 33c
Copper Drops..... " @ 33c
Sheets, 6 to 9 ℔..... " @ 38c
" 10 to 12 ℔..... " @ 35c
Braziers, 13 lb..... " @ 32c
Copper Bottoms..... " @ 33c
Zinc. Lasac, 500 to 1000 lbs.....₱ ℔ 10½c
Case, 100 lbs..... " 11 c
Slab..... " 7½c
Brass.—Roll, No. 6 to 30.....₱ ℔ 30c
Roll, No. 30 to 38..... " 35c
Wire, No. 0 to 20..... " 35c
" 20 to 25..... " 40c
" 25 to 30..... " 50c
Babbit Metal.—Sellew & Co..... " 30c
Allens'..... " 17c
Market..... " 12c
Antimony.....₱ ℔ 17c
Bismuth.....₱ ℔ $4 00
Nickel.....₱ ℔ $3 50
Sheet Iron.—Gen. Russia.....₱ ℔ 20c
Planished A.....₱ ℔ 14c
" B..... " 12½c

	Com. B.	Smooth Fin. S. L. U.	Smooth D Re'fd.
15 to 20	4 3-10	5 5-10	7 3-10
22 to 24	4 4-10	5 4-10	7 4-10
26	4 50	5 50	7 5-10
27	4 75	5 75	7 75

Galvanized Iron.—Full oundles.....dis 25 %

Nos. 18 to 20	12c	No. 26	14c
22 to 24	13c	27	15c

Bar Steel.—Silver, ₱ ℔ 16c; Crescent, 21c.
Iron Wire.....dis 33 %
Enameled Ware.....dis 45 %

One Piece Corrugated Elbows.....dis 10 %

Charcoal Iron.		Russia Iron.	
4½ inch.....	₱ doz $2 50	4½ inch.....	₱ doz $5 00
5 "	" 3 50	5 "	" 7 00
5½ "	" 4 50	5½ "	" 7 50
6 "	" 5 50	6 "	" 12 00
7 "	" 6 50	7 "	" 14 00

Leader Elbows, Flat Crimp Retinned or Galvanized.—Dis. 10 %

	₱ doz.		₱ doz.
2-inch.....	$1 75	2½-inch.....	$2 75
3-inch.....	2 25	3½-inch.....	3 25
4-inch.....	2 50	4½-inch.....	3 50

Sheet Iron Bread Pans.....₱ ℔ 10c
American Broilers.....₱ doz. $13 50
Tinmen's Machines.....dis 5 %
Sad Irons.....₱ ℔. 3½c
Brass Kettles.—Ansonia.....48c
Dog Irons.....4 c

PITTSBURGH.

The following are the Card rates of Lewis, Oliver & Phillips, H. B. Newhall, 11 Warren St., New York, Agent. Iron, standard list assorted sizes, for large orders, specifications to include Bands, small Rounds and Ovals, 75c. rate, 2 % off net.
Flat Rail (1¼x¼), punched and coun'sunk..4·1c ₱ ℔ net
Iron Wedges.....4½c ₱ ℔ net
Norway Nail Rods.....8½c ₱ ℔ net
Crow Bars (in ordering please state whether "Wedge" or "Pinch" point).....4¼c ₱ ℔ net
Beetle Rings.....8 c ₱ ℔ net
Fence Pickets—
⅜ round, bent to shape, 25c ₱ ft. of fence, less 15 % off net.
Discount off Standard List.
Carriage and Tire Bolts.....75 % off net
Carriage and Tire Bolts delivered on cars or boats in Pittsburgh.....20 % off net
Stove Bolts.....40&10 % off net
Machine and Square Head Bolts.....40&10 % off net
Coach and Lag Screws.....40 % off net
Bolt Ends.....
Pat. Hot Pressed Square and Hexagon Nuts, small sizes, from 3-16 to ⅜ in.....8½c ₱ ℔ off net
Pat. Hot Pressed Square and Hexagon Nuts, large sizes, from 7-16 to 2 in.....6½c ₱ ℔ off net
Washers, all made from new band iron, small sizes, from 3-16 to ⅜ in.....9½c ₱ ℔ off net
Washers, all made from new band iron, large sizes, from 7-16 to 1⅜ in.....7½c ₱ ℔ off net
Nuts and Washers in 25 lb. boxes, ½c ₱ ℔ ex. Nuts and Washers in lots less than one keg each size, ½c ₱ ℔ ex. Nuts and Washers in 5 lb. boxes, 1c. ₱ ℔ ex. net prices.
Standard Caps, for Plows.....5½c. ₱ ℔ net
Iron Harrow Teeth, in lots of 1 ton or more, packed in 200 lb. boxes, 1 in. diam. 3¼c ₱ ℔ net; ⅞, ¾ in. diam. 3½c ₱ ℔ net; ⅝ in. diam. 3¾c ₱ ℔ net.
Patent Headed Harrow Teeth, packed in boxes ½c ₱ ℔ ex
Skein Bolts, in bulk, in lots of 1 keg or more, ⅝ in. diam. 5c ₱ ℔ net; 9-16 in. diam. 6c ₱ ℔ net; ½ in. diam. 7c ₱ ℔ net. 1c ₱ ℔ extra when less than 1 keg of each size is ordered.
Strap & T Hinges...33½&10 % off net, delivery as custo'ry
Screw Hitching Rings.....$5 25 ₱ 100 net
Bridge and Roof Bolts—
1 to 2 in. diam. over 8 ft. long.....₱ ℔ 3¾c net
1 to 2 in. diam. from 4 to 8 ft. long..... " 4 c net
1 to 2 in. diam. from 1½ to 4 ft. long..... " 4½c net
⅞, ¾ and ⅝ in. diam. over 4 ft. long..... " 4½c net
⅞, ¾ and ⅝ in. diam. from 1½ to 4 ft. long " 5 c net
Bridge bolts with upset ends.....¾c. ₱ ℔ extra
Wrought Iron plates, punched.....4¾c. ₱ ℔ net
Cast Iron Washers.....₱ ℔ 3½c net
Duck Nest Tuyere Irons.....$14 50 ₱ doz net

WAGON HARDWARE.

Wagon Box Strap Bolts—

10 in. long by 7-16 at Screw End, ₱ set of 8 bolts..							45c
12	"	½	"	"	8	"	55c
10	"	9-16	"	"	8	"	65c
12	"	9-16	"	"	8	"	70c
14	"	9-16	"	"	8	"	80c
10	"	⅝	"	"	8	"	80c
12	"	⅝	"	"	8	"	90c
14	"	⅝	"	"	8	"	90c
16	"	⅝	"	"	8	"	1 00
18	"	⅝	"	"	8	"	1 10
20	"	⅝	"	"	8	"	1 20

5c ₱ set for each additional inch over 14 in. All lengths made.
In ordering Box Strap Bolts please give diameter at Screw End.

Wagon Box Rods, narrow track, each	15c
" " wide track, each	17c
Single Tree Irons, ₱ set of four pieces	30c
Wrought Iron Bolster Plates, 2¾ in. wide, ₱ set	45c
" " 3 " "	50c
" " 3½ " "	55c
" " 3½ " "	60c
Wagon Brake Ratchets, each	14 c
" " finished with guard, each	40 c
Wrought Hammer Straps, heavy pattern, each	13 c
" " light " each	12 c
" Rub Irons, each	9 c
Stay Chain Hooks, each	5½c
Double and Single Tree Clips, figure 1, each	8 c
" " " 2, each	9 c
" " " 3, each	11 c
Axle Clips, Round Part ⅝, Flat Part 1¼, each	8c
Wagon Clevis, including Pin, complete, each	10c
Pole Caps, each	24c
Single Tree Hooks, Nos. 1 and 2	4½c
Strap Bolts, Rods, Single Tree Irons, Bolster Plates, Brake Ratchets, Hammer Straps, Rub Irons, Stay Chain Hooks, Clevis and Pin, Clips, Single Tree Hooks, and Pole Caps, in lots of 50 sets	dis 15 %
Wagon Box Staples, 1½ to 2½ in. to clinch, ₱ 1000	$11 00 net
" " " Bevel Box Iron, to rivet on, ₱ 1000	7 50 net
Neck Yoke Eyes, each	4½c net
" " " with ⅝ rings, each	7½c net
King Bolts, ¾, 1, 1⅛, and 1¼ in. diam	₱ ℔ 4¼c net
Wagon Rivets, ex. large, flat, oval and steeple head, ¼ in. diam. all lengths	" 6½c net
Wagon Rivets, 5-16 in. diam., all lengths	" 9½c net
" ⅜ to 1 inch long	₱ ℔ 1c extra
" & Nails, in 5 ℔ paper boxes	" 1c extra
" in 25 ℔ wood	" ½c extra
Wagon and Hinge Nails, ¼ in.	₱ ℔ 17 c net
" " 5-16 in.	" 19 c net
Wagon Rivets and Nails, in less lots than one keg each size	" ½c extra
Double Tree Plates	" 5c net
Coupling "	" 5c net
Tongue "	" 8½c net
Neck Yoke Plates	" 10½c net
Tongue Cap Iron, 1½, 2 & 2½ in. wide, same price ₱ ℔ as Band Iron.	
Wagon Chains, Stay, Lock and Tongue, 5-16 in.	₱ ℔ 10½c net.
¼ in., 11½c. net	

Above prices are free on board cars in Pittsburgh. Subject to change of market, without notice.

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(Reported by Messrs. Jewett & Root.)

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IC. 10x14.....$11 00
IX, 10x14.....13 75
XX, 10x14.....16 50
IC. 12x12.....11 50
IX. 12x12.....14 25
IC. 14x20.....14 00
IX. 14x20.....14 75
XX. 14x20.....17 50
XXX. 14x20.....20 25
XXXX. 14x20.....23 00
Dc. 100 Plate.....10 50
DX.....13 25
DXX.....16 00
DXXX " 18 75
DXXXX 100 Plate..21 50
IX, 14x14.....12 75
IC, 10x14 W.....10 50
IX, 10x14 W.....13 25
Roofing Tin.—Best Char.
IC, Terne, 14x20.....$10 25
IX, " 14x20.....13 00
IC. Terne, 20x28.....22 00
IX, " 20x28.....27 00
Coke Tin.—
IC, 10x14 Coke.....$10 00
IX, 10x14, Coke.....12 75
IC, 14x20, " 11 00
Pig Tin.—
Large Pigs.....26c
Small Pigs.....27c
bars.....28c
Solder.—No. 1.....16c
No. 2.....15c
Sheet Zinc.—
In any quantity.....10¾c
Bright Wire.
$1 lbs. in bdl.....dis 40 %
Copper.—
Sheathing.....31c
Copper Bottoms.....32c
Planished Copper.—
Sheathing, 14x48.....38c
Boiler Size, No. 7.....40c
" No. 8.....40c
" No. 9.....40c
Sheet Iron.—
No. 18 Am. Com.....4 40
No. 24 Am. Com.....4 60
No. 26 Am. Com.....4 80
Patent Planished Russia, Nos. 24, 25 and 26....14c
Genuine Russia, No. 9, 10, 11 and 12.....18c
Broken bdls. ½c. extra.
W. D. WOOD'S & CO. 8 SHEET IRON.—
Nos. 15 to 20 Smooth $5 10
" 21 to 24..... 5 80
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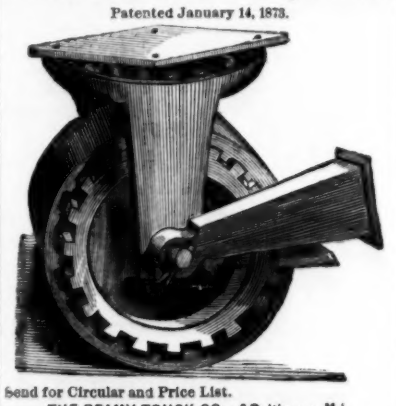
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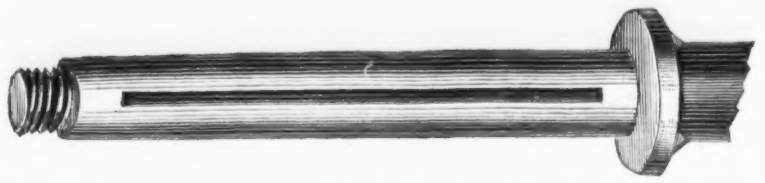
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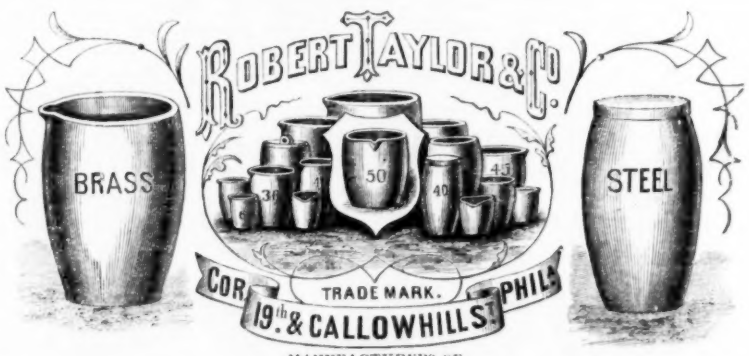
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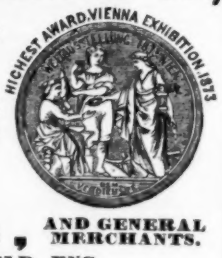
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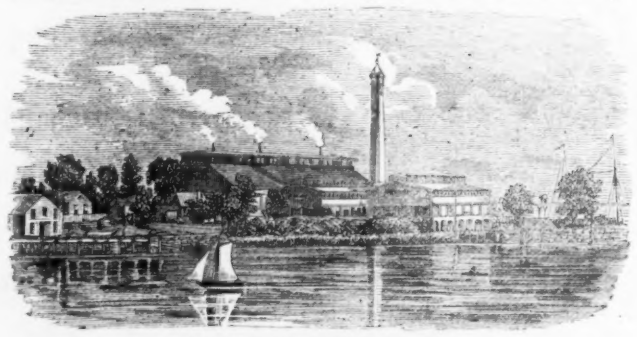
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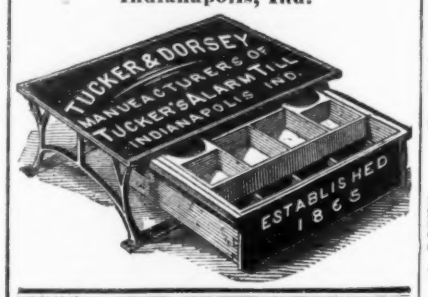
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Fancy Body, Patent Leather, Leather Bound, Extra Tinned, 26, No. 1.....2·50
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Fancy Body, Patent Leather, Leather Bound, Silver Plated, 26, No. 1.....3·50
Shaft, Strap, White Metal, House Bells, extra, 6, No. 1.....per pair, 50c.
Common, 6, No. 1....." 45c.
Blind Hinges.—
Orr or Washburn's.....per hundred sets $9 50
Blind Fasts.—
Orr or Washburn's.....per hundred set $6 00
Bolts.—Carriage. Phila.. " Girard Works....dis 50&10 %
Borax.—Best Refined.....₱ ℔ 15c
Borers.—Angle. Backus'.....dis 30 %
Boring Machines.—Angle.....each $4 75
Common. Snell's quality.....each 3 75
Braces.—Barber's.....dis 40&5 %
Backus'.....dis 50 %
Spofford's.....dis 50 %
Amiaon.....dis 50 %
Brackets.—Star Bronzed.....new list net
Star Japanned.....new list net
Store Shelf.....new list net
Brass Faucets.—L. F. & C.....dis 25 %
Butts.—Union Drilled Loose Joint.....dis 45&10 %
" " Wire Fast Joint.....dis 25&10 %
" " Acorn Loose Joint....dis 40&10 %
Brass Butts.....dis 30 %
Wrought Table Butts and Back Flaps.....dis 30 %
Wrought Narrow Butts.....dis 30 %
Can Openers—Sprague's.....dis 50 %
No. 1. Iron Handle.....$4·00
No. 2, Wood Handle.....4·50
Cartridges.—" U. S. Cartridge Co."....dis 50&10 %
Chisels.—"Buck Bros.' Sha' \Goods....add 20 @ 22½ %
Socket".....add 22½ @ 25 %
Churns.—Lightning—
Redheffer patent..... 3 4 5 6 gall
per doz $22 00 $27 00 $31 50 $36 00
Coal Hods.....dis 35 %
Fancy Japanned, No. 4, 15 in., $8·00; 5, 16 in., $9·00; 6, 17 in., $10·00.
Fancy Galvanized, No. 4, 15 in., $11·50; 5, 16 in., $13·00; 6, 17 in., $14·00.
Perfection, Jap'd, No. 4, 15 in., $12·00; 5, 1 in., $13·00; 6, 17 in., $14·00.
Perfection, Galv'd, No. 4, 15 in., $15·00; 5, 16 in., $16·00; 6, 17 in., $17·00.
Morning Glory, Jap'd, No. 4, 15 in., $12·00; 5, 16 in., $13·00; 6, 17 in., $14·00.
Morning Glory, Galv'd, No. 4, 15 in., $15·00; No. 5, 16 in., $16·00; No. 6, 17 in., $17·00.
Compasses and Dividers.—Bemis'.....dis 35 %
P. S. & W.....dis 25 %
Cordage.—Manila (usual trade dis.).....₱ ℔, 15c
American Tarred Hemp Lath Yarn.....₱ ℔, 10c
Corn Hooks.....per doz $2·75
Cow Ties.....dis 10 %
No. 30, Open Ring, 3 foot, No. 6, with Toggle.....$3·70
No. 35, " 3 " No. 6, " Snap.....3·90
No. 40, " 3½ " No. 5, " Toggle.....4·25
No. 45, " 3½ " No. 5, " Snap.....4·40
No. 50, " 4 " No. 4, " Toggle.....4·85
No. 55, " 4 " No. 6, " Snap.....5·00
No. 60, " 4½ " No. 5, " Toggle.....5·60
No. 65, " 4½ " No. 3, " Snap.....5·80
Crow Bars.—Iron. Steel Points.....₱ ℔, 5½c
"Sweet" Steel Bars.....₱ ℔ 11c
Brown's Steel Bars.....₱ ℔ 10c
K. P. & Co. Extra Drill Steel.....₱ ℔ 15c
Dividers.—Cook's Nickel Plated.....dis 15 %
Door Springs.—Stimson's Patent.—
No. 7, Light inside doors, $12·00.—.....dis 25 %
No. 8, " outside " $18·00.....dis 25 %
Torrey's.....$4·00
Egg Beaters.—Lightning, Redheffer pat. 1 qt., 2 qts.
per doz $8 00 $12 00
Emery.—Alden.....₱ ℔ 6½c
Wellington Mills.....₱ ℔ 10c
Files.—Earl Smith & Co.'s English.....$5 to £ gold
American.....$5 to £ currency, less 12½ %
Nicholson.....new net list
Wheeler, Madden & Clemson.....£5 net
Stubb's Tapers, genuine, 3 in., $1·50; 3½, $1·62, 4, $1·88; 4½, $2·13; 5, $2·50.
Funnel Irons.—$2·50 2·50 2·50 3·25 per doz
5, 5½, 6, 7 inch.
Deep Flange.—$3·50 3·75 4·00
5, 5½, 6 inch.
Hammers.—Maydole.....dis 12 %
M., B. & D., solid cast steel, adze eye, No. 1, $10; 1¼, $7·75
" " " " bell face, No. 1, $11; 1¼, $9·75.
Hangers & Rollers.—Novelty.....dis 30 %
Anti-Friction.....$1·25 per pair—dis 30 %
Hatchets.—Underhill Edge Tool Co.....dis 15 %
C. F. Dowse, warranted Cast Steel—
Shingling.....0, $4·75; 1, $5·25; 2, $5·75
Claw.....1, 5·75; 2, 6·25
Lathing.....1, $5·50
Axe Pattern.....1, $7·00; 2, 7·50
Broad....0, $5·75; 1, $6·50; 2, $7·50; 3, $9·25; 4, $10·75; 5, $12·75; 6 $14·75.

Hinges.—Strap and T. Stanley Works.....dis 33⅓&10 %
Plate, Loose and Fast Joint.....₱ ℔ 6c
Wrought Screw Hook.....₱ ℔ 6½c
Knobs.—Young's Imp. Stiverd Glass.....dis 45 %
Lanterns.—Tubular No. 0.....$9·50
Guarded. No. 74, (with kerosene oil and candle burners).....6·25
Lead.—Sheet and Pipe.....8c—less 10 %
Locks.—Norwalk Lock Co.....dis 40&5 %
Mattocks.—
K. P. & Co., axe finish, long cutter.....$13 00—dis 10 %
Short cutter.....12 75—dis 10 %
Meat Cutters.—" Miles's" Challenge.....dis. 30 %
No. 1, $22·00; 2, $30·00; 3, $40·00.
Metal.—Babbitt. No. 1, 35c; 2, 25c; 3, 16c; 4, 15c ₱ ℔
Nails.—10d and larger—dis 15c 100 keg lots.....$3 50
Nail Pullers.—Little Giant—Small.....per doz., $22·00
Little Giant—Large....." 30·00
Padlocks.—Wilcox.....dis 40&5 %
All Brass, 2¾ inch, 2 keys, job lot.....$9 00
Paper.—Tar'd Sheathing.....₱ ℔ 2 c
Dry Sheathing....." 3½c
" " "Beaver Brand" Rosin Sized.." 4½c
Tar'd " " " " " 3½c
Felt " " " " " 4½c
Picks.—
h. P. & Co. Axe Finish..₱ doz 5 to 6 $8·50; 6 to 7 $9·00
" Solid Eyes.....5 to 6 6 to 7
$9 00 $9 50
Pins.—Universal Hat and Coat shi wood—
2 in.....₱ gross $2 50; 3 in., 3 50; 4 in., 4 50—dis 15 %
Potato Digger.—
"Partridge," 6 square tine.....₱ doz $12 00
Shumway & Co., 6 round tine.....₱ doz 9 00
Pulleys.—Axle.....1¼ No. 15, 31c; 1¼ No. 18, 33c; 1¼ No. 28, 42c; 2 No. 29, 49c.
Nashua, Bronzed Face.....1¼, 80c; 2, 90c
Steel Axle " " .....2, $1·00
Pulley Blocks.—" Best Boston Make".....net
Common Strapped Blocks—
4 5 6 7 inch.
Single, 75c. 85c. $1·00 $1·13 each.
Double, $1·00 1·12 1·25 1·60 "
Inside Iron Strapped Blocks—
5 6 7 8 9 10 inch.
Single, $1·00 1·13 1·38 2·00 2·25 1·75 each.
Double, 1·88 2·30 2·63 3·65 4·00 5·00 "
Inside Iron Strapped Blocks, with Patent Roller Bushings—
5 6 7 8 9 10 inch.
Single, $1·25 1·50 1·65 2·50 2·65 3 50 each.
Double, 2·50 3·00 3·38 4·63 5·00 6·50 "
Planed Ware.—Rogers Bros.....dis 50 %
Plumb & Levels.—" Davis" Pat. Adjustable—
No. 1, Iron and Wood Center Levels.....dis 50 %
No. 2, First Quality Levels.....dis 60&10 %
No. 3, Iron Pocket " .....dis 35 %
No. 4, Level and Plumb Glasses.....dis 60&10 %
No. 5, Iron Pocket Levels, per square and straight edge.....dis 50&10 %
No. 6, Improved Iron Bench Planes.....dis 30&10 %
Pocket Knives.—Conn. Cutlery Co.....new net list
American Shear Co.....dis 33⅓ %
Rail Karn Door.—For Novelty and Anti-Friction Hangers.....per foot 7c.. dis 30 %
Rivets.—Black.....dis 25 %
Carriage, oval head, Nos. 3, 4, 5, 6, 7, 8.
13 13 14 14 15 16c ₱ ℔ net
Rubber Moldings.—" Harmon's".....dis 10 %
No. 2, for Windows.....per foot, 5c
No. 3, for Doors.....per foot. 10c
No. 4, " .....per foot. 12c
Sad Irons.—Bless & Drake.....₱ ℔ 3½
Sand Paper—0 to 2, $4·25; 2 to 3, $4·75.....dis 10 %
Saws.—*Hand and Panel*—
Wheeler, Madden & Clemson's, same list as " Diston's".....dis. 15 %
Disston's.....dis. 12½ %
Cross Cut—
Wheeler, Madden & Clemson X Cuts.....per ft., 37c
" " " "Star" X Cuts. " 60c
" " " Champion X Cut. " 50c
" " " One Man X Cut..each, $2·25
Boynton's genuine Lightning X Cut.....per ft., 60c
" " " One Man X Cut..each, $2·25
Circular—Wheeler, Madden & Clemson's.....dis. 25 %
Mill— " " " .....dis. 25 %
Screws.—American Screw Co.....revised list dis 62½ %
Aiken's.....dis 60&10 %
Scythe Stones.—
" Willoughby Lake," first quality.....₱ gross $6·50
" " second quality.....3·00
Shovels.—O. Ames.....dis 20 %
M. B. & D.....new list dis 12½ %
Snow, Malleable Iron Tip, D Handle—Agents for New England.....$6·50
Snow, Malleable Iron Tip, long Handle—Agents for New England.....5·50
Sifters.—Coal, Rice, &c.....$12 00
Spading Forks.—M. & E.....dis 25 %
Stone Pickers.—" Partridge," original...₱ doz $15 00
Tools.—Aiken's Pattern, 20 in set; Parr's..$8·00 per doz
Traps.—Oneida.....dis 30 %
Blake's.....dis 30 %
Vises.—K. P. & Co.'s Solid Box. Blacksmith....₱ ℔ 13c
Parker's Parallel.....dis 10 %
Backus.....dis 25 %
" Howards," Parallel.....dis 20 %
Wardrobe Hooks.—Wire to drive.....₱ gross $1 00
Weather Strips.—" Harmon's".....per doz $5, d.. 10 %
Weights.—Winnow Weights.....₱ ℔ 2c
Wedges—Axe.....₱ doz 38c
Wire.—Eureka, in spools, No. 28 to 40 assorted...₱ gross $3 50
Wire Netting.—Clinton Wire Cloth Co., Green, Drab or Black.....₱ ft 5½c
Wrenches.—Genuine Wrenches, G. A. Coes..dis 40&5 %
Walton.....dis 50 %
Wringers.—
Novelty and Universal } Tub No. 2 } Less than 2 doz, $12 00
2 doz or more, 10 00
Bench A.... less than 2 doz $86 00; 2 doz or more $84 00
" B.... " " 94 00 " " 92 00
" C.... " " 110 00 " " 107 00
Eureka.....per doz $58 00
Withington, Cooley & Co.—
Hoes, Rakes, Forks, &c.....dis 33⅓ %

Boston Metal Market.

(Corrected by Fuller, Dana & Fitz, 110 North Street, Boston, Importers and Commission Merchants.)

Iron.—Best Refined Bar Iron.....₱ ton $60 00 @ 62 50
"Burden Best" " " " 100 00
Swedish Bar Iron.....gold " 110 00
Norway Shapes.....gold " 125 00
Norway Nail Rods.....gold " 130 00
Sheet Iron, American.....₱ ℔ 4¾c
" " Galvanized.....₱ ℔ 9 c
" " Russian.....gold " 14 c
Plate Iron, C. No. 1.....₱ ℔ 3¾c
Iron Rails.....₱ ton $52 00
Steel Rails.....77 50
Pig Iron, Foundry, No. 1 extra.....29 00
" " No. 2 extra.....27 00
" Gray Forge.....25 00
" Scotch.....30 00 @ 32 00
Wrought Scrap Iron.....31 00
Old Rails.....27 00
Steel.—₱ ℔ | German.....₱ ℔ 9½c
Eng. Tool, gold 15½c | Spring..... 6 c
American Tool 14 c | Tire..... 6¼c
" Mach 9¼c | Sleigh Shoe..... 5 c
Bessemer..... 7 c | Toe Calk..... 7¼c
Tin Plates.—₱ box gold | **Copper.**—₱ ℔
I. W. Char. 10x14 @ $8·75 | Ingot..... 23½c
I. C. Coke 10x14, 7 50 @ 8 00 | Bolt..... 30c
Char. Roof. IC. 14x20. 8 00 | Sheathing..... 30c
Coke " IC, 14x20, 7 00 | **Lead.**—₱ ℔
METALS. | Pig..... 7½c
Pig Tin.—₱ ℔., gold | Sheet & Pipe..... 8·55
Banca..... 21c | **Zinc.**—Sheet..₱ ℔ 10c
Straits..... 19c | **Spelter.**.....₱ ℔ 7¼c
English..... 19c | **Antimony**, gold ₱ ℔ 12¼c

ST. LOUIS.

Corrected weekly by Semple, Birge & Co.

Apple Parers.—Conqueror.....₱ doz, $7 75
Hudson's Rotary.....7 75
Axes.—Wm. Mann's, Red Warrior.....₱ doz $11 50
Wm. Mann's, W. Stewart's.....11 00
" C Marshall.....10 50
" Handled.....$5 extra
" Double Bitted.....2 50
H. L. B. & Co.'s, L. & Co.....11 50
" Pioneer.....12 00
" James & Co.....11 00
Hunt's.....12 00
Axles.—Jones, Henry & Co.'s" Patent Lubricating, Half Patent, Swelled Taper, Plain Taper and Concord Axles.....dis 10 & 5 %
Common Axles (Pat. Lubricating), 1¼ inch and upward.....₱ ℔. 6½c.
do. less than 1¼ inch.....7 c.
Bellows.—Best St. Louis make..60c ₱ in. dis 30&2½ %
Bells.—Troy, Church, School and Farm Bells..₱ ℔ 44c
"Improved Amalgam Bronzed," 15 in $3·00;
17 in., $4·00; 19 in., $6·00.....dis 10 %
Belting.—"Boston Belting Co.'s Rubber..dis 30&7½ %
"Bradford & Sharp's" Oak-Tanned Leather....dis 30 %
Bolts.—Arms, Bell & Co.'s Carriage & Tire..dis 50&10 %
Arms, Bell & Co.'s Machine.....dis 30&10 %
Butts.—Western Butt Co.'s new list—
Narrow Fast Joint.....dis 25&10 %
Broad Fast Joint.....dis 30&10 %
" Loose " .....dis 45&10 %
Reversible.....dis 40&10 %
" Japanned and Silver Tipped.....dis 40&10 %
Loose Joint " Acorn " " .....dis 40&10 %
Wheeling Hinge Co.'s W't Fast Joint Narrow.....dis 30 %
" " " Broad.....dis 35 %
" " " Loose Joint.....dis 35 %
" " " Reversible.....dis 35 %
" " " Table & B'k Flaps.....30 %
Churns.—Julian, No. 2, $7·00; No. 3, $7·50; No. 4, $8·50.....dis 20 %
Cider Mills.
American Senior, $40·00; Am. Junior, $25·00.....dis 15 %
Corn Knives.—Dunn Edge Tool Co.'s Clip..5 75
Seymour Mfg. Co.'s Solid Steel Back.....5 00
Corn Shellers.—Sandwich Mfg. Co.'s—
Power Shellers.....dis 10 %
Hand Shellers.....Special rates
Corn Planters.—Challenge, Horse.....$49·00 net
St. Louis, Hand.....per doz $15·00
Cotton Gins.—Dubois Patent.....dis 10 %
Crow Bars.—Steel Pointed.....₱ ℔ 6½c
Drag Saw Machines.—
Culver's Iron Drag Saw.....dis 10 %
Robinson's Patent Sweepstakes Drag Saw....dis 10 %
Fanning Mills.—Nash & Cutt's.....dis 15 %
Feed Cutters.—Improved Burdick National...dis 15 %
Sanford No. 1, $12 00; No. 2, $8 75.....net
Files.—Black Diamond, Mill.....$5·00 £ currency.
" Bastard.....5·00 £ currency.
" Taper.....5·00 £ currency
Forges.—Keystone Portable Forge Co.'s.....dis 12½ %
Forks and Hoes.—
Auburn Mfg. Co.'s Hay and Manure Forks....dis 33⅓ %
" Handled Hoes.....dis 33⅓ %

Garden Seed Drills and Wheel Hoes.
Allen's Double Wheel Hoe.....dis 15 %
" Planet Drill, Nos. 2 and 3.....dis 15 %
" Combined Drill and Wheel Hoe.....dis 15 %
Grinding Mills.—French Burr Mills.....net list
Challenge Feed Mills.....dis 30 %
Sedgebeer's Nonpareil Mills.....dis 10 %
Osage Corn and Cob Mill.....dis 30 %
Hammers.—Masons' Hammers.....₱ ℔ 20c
Smiths' Hand.....20c
Handles.—No. 1 Fork, Hoe and Rake.....dis 20 %
No. 2 Fork, Hoe and Rake.....dis 40 %
Harrow Teeth.—1 inch iron.....₱ ℔ 4½c
⅞ and ¾ inch iron....." 5c
Barbed or Headed.....½c extra
Hay and Cotton Presses.—
Dederick's Railroad.....dis 5 %
" Perpetual.....net
Hay Knives.—
Dunn Edge Tool Co.'s.....₱ doz $15 00—dis 15&5 %
Lightning (Weymouth's Patent).....₱ doz $20·00
Hinges.—
Wheeling Hinge Co.'s Strap & T.....dis 33⅓&10 %
Horse Hay Fork.—Nellis' Harpoon.....dis 20 %
Horse Nails.—National Patent Pointed.....20c rates
National Patent Pointed, extra finished.....20c "
Horse Powers.—Pitts or Carey's Patent.....dis 10 %
Wheeler's Railway.....dis 10 %
Sandwich Lever.....dis 10 %
Horse Rasps.—Heller Bros.....dis 40 %
" Black Diamond ".....$6·00 to the £ currency
Horse Shoes.—
Rhode Island (Perkin's Pattern).....₱ keg, $5 50
" Mule....." 5 50
" Trotting Shoes....." 6 00
Tredegar Horse.....per keg $5 50
" Mule.....per keg 5·50
Hose.—
Boston Belting Co.'s Rubber Medium Sizes..dis 30&10 %
" " " Small Sizes, Hydraut.....dis 40 %
Ice Tools.—W. T. Wood & Co.'s Saws.....new list net
W. T. Wood & Co.'s Chest Hatchets.....new list net
" " Axes.....new list net
" " Loading Tongs.....new list net
" " Medium, Small and Family Tongs.....new list net
" " Chisels, Hooks and Grapples.....new list net
Lawn Mowers.—Archimedean.....dis 20&5 %
Charter Oak.....dis 20 %
Mattocks and Grub Hoes.—
Klein, Logan & Co.'s Mattocks..₱ doz $13 00 @ 13 5
" " Grub Hoes, oval eye....." 10 00 @ 11 50
Money Drawers.—
Pierpont & Co.'s Excelsior.....per doz $40·00 net
Nails.—Wheeling.....$5 45 rates
Packing.—Boston Belting Co.'s Rubber, Plain..dis 30 %
Boston Belting Co.'s Rubber, Pure.....dis 25&5 %
" " No. 2 Plain.....dis 40 %
" " Round and Square....dis 10&10 %
Picks.—Klein, Logan & Co.'s Railroad and Clay.....₱ doz $9 50 @ 11 00
Klein, Logan & Co.'s Coal....." 7 45 @ 8 40
" " Pick....." 12 60 @ 13 50
" " Stone....." 14 40 @ 14 90
" " Tamping....." 14 75 @ 15 25
" " Miners' Drifting....." 10 25 @ 12 80
Plows.—Avery's Cast and Steel.....dis 15 %
Collins Cast Cast Steel.....new list net
Perkin Steel.....new list net
Post Hole Augers.—Clark's Patent—
No. 1, ₱ doz. $27; No. 2, $30; No. 3, $32.....dis 30 %
Pulleys.—5 inch.....per doz $4·25 n e
4 inch.....per doz $3·25 n e
Nellis' Patent.....new list dis 15 %
Pumps.
St. Louis, Farm, Patent Metal Lined...new list dis 50 %
Rakes.—Paddock's Premium Sulky.....$30 00 net
St. Louis Revolving 14 tooth.....5 50 net
" 16 " .....6 00 net
" Hand Hay Rake.....dis 10 %
Reaper Knives and Sections.—
Geo. Barnes & Co.'s Knives.....dis 40 %
" " Sections.....dis 40 %
Road Scrapers.—Steel.....dis 45 %
Cast Iron.....dis 10&2½ %
Sad Irons.—Monitor Brand, Silver Polished...₱ ℔ 6c
Sash Weights.—Standard Solid Eyes.....₱ ℔ 3½ c
Saws.—Curtis & Co.....dis 10 %
Screws.—Dunn Edge Tool Co.'s.....new list dis 40&5 %
Scythe Stones.—No. 1 Ind'n Pond ₱ gr's, $7 00
Extra Indian Pond " 7 50
Premium " 10 50
Diamond Grit " 13 00
Shovels and Spades.—Myers & Armor.....dis 15 %
O. Ames & Son.....dis 5 %
Grain Scoops, (Pat. Corrugated Straps) M. & A. dis 15 %
" " T. Rowland's dis 15 %
" " " O. Ames & Son dis 5 %
Sledges.—Smith's Stone or Coal Sledges—
Steel Face Polished.....₱ ℔ 15c
Solid Cast Steel....." 35c
Spaths and Cradles.—Seymour Mfg. Co.'s..dis 20 %
Sorghum Machinery.—Bell Cane Mills.....dis 15 %
Scantlin's Seamless Evaporators.....dis 10 %
Springs.—Cleveland Spring Co.'s—
Carriage and Express.....dis 12½ %
Blue Seat Springs.....dis 15 %
Vises.—Solid Box.....₱ ℔ 16c
Wilson Mfg. Co.'s.....dis 15 %
Wheelbarrows.—Railroad & Garden.....new list net
Wrenches.—Coes' Genuine.....dis 33⅓&1
Coes' Pattern.....dis 50&
Wagons.—Whitewater Farm Wagons—
Thimble Skein.....No. 3, $46; 3½, $50 3½, $51
Iron Axle.....No. 1½, $60; 1¾, $65 1¾, $90

St. Louis Metal Market.

(Corrected Weekly by Messrs. R. Sellew & Co.)

Tin Plate.

IC, 10x14, Char	10 50	IX, continuous, 30 in. x 200 ft.	
IX, 10x14, "	13 00	IC, 10x14, best Coke	$9 5
IC, 12x12, "	11 00	IC, 10x14, good	
IX, 12x12, "	13 50	Coke	9 0
IC, 14x20, "	11 50	IC, 10x20	13 0
IX, 14x20, "	14 00	IX, 14x20, Coke Lead	9 0
IC, 14x30, Terne	10 00	IC, 14x30, " "	10 0
IX, 14x30, "	12 50	IC, 14x28, " "	9 0
IC, 20x28, "	20 00	IX 20x28, " "	24 50
IX 20x28, "	24 50	IC, 10x14, punch'd for Safes	10 0
IC, continuous 30 in. x 200 ft.			

Block Tin.

Large Pigs	25c	Bars	27c
Small " L. & F	25c		

Sheet Zinc.

Casks	₱ ℔ 10½c	Sheet	₱ ℔ 10¾c

Solder

No. 1, Refined, in bars or plate	16
No. 2, " " "	15
Pig Lead	7c

Sheet Copper.—15 to 100 lbs. Sheets 30x60..... 31c
14 to 16 lbs., Sheets 30x60..... 31c
10 to 12 lbs., " " and 20x72..... 32c
6 to 9 lbs., " " 35c
Tinned, 14 and 16 oz. 14x48..... 30c
Planished, 14 and 16 oz. 14x48..... 35c
" No. 7, 8 and 9..... 40c
Copper Bottoms..... 34c

Sheet Iron.

	Common.	Smooth. Com.	Smooth Charcoal.	Smooth Juniata.
No. 24	4¼c	5¼c	6¾c	8¾c
25 & 26	4¼c	5¾c	7 c	9 c
27	4¾c	6 c	7¾c	9¾c

Galvanized Iron.....dis 30 %

No. 16 to 20	14c	No. 27	15c
21 to 24	13c	28	16c
25 & 26	14c		

Russia Iron.—Perfect..... 13c | No. 1 Stained..... In sheets, 1c. higher.
American Russia.—A..... 11c | B..... 11c
In sheets, 1c higher.
Lead.—Pig..... 7½c | Bar..... 8½c | Lead Pipe, in full coils 8¼c | Lead Pipe, when cut..8¾c | Sheet Lead..... 8¾c
Wire—Bright..... dis 30 %
Coppered..... dis 30 %

CHICAGO.

(Reported by Frank Sturges & Co., 74, 74 & 76 Lake St.)

Tin Plate.—

10x14, IC, Ch'l. Good	8	14x20, IX, Ch'l Best	$14 00
10x14, IC, " Best	10 00	14x20, IXX, " "	16 50
10x14 IX, " "	13 00	14x20, IXXX, " "	19 00
12x12, IC, " "	11 00	DC, 100 Plate, " "	10 50
12x12, IX, " "	13 50	DX, " "	13 00
14x20, IC, " "	11 50	DXX, " "	15 50
		DXXX " "	18 00
		14x14, IX, " "	23 50

Roofing IC, Charcoal, Best..... 10 00
Roofing IX, Charcoal " 12 50
20x28, IC, Charcoal Roofing, Com..... 19 00
20x28, IC, " Good..... 19 50
20x28, IC, " Best..... 20 00
20x28, IX, " " 24 50
10x14, IC, Coke Plates..... 9 50 @ 10 00
14x20, IC, " ..... 10 00 @ 10 50
10x20, IC, " 13 00

Block Tin.—

Large Pigs	24c	Bars	27c
Small	26c	Straits, 2c. higher.	

Zinc.—Sheet, 500 to 1000 lb. Casks..... 10½c
Loose Sheets..... 11c
Slab Zinc or Spelter..... 7½ to 8
Copper.—Bottoms..... 34c
Sheathing..... 30 c
Planished..... 39c
" Boiler lengths..... 41c
Ingot..... 34c to 35c
Bolt..... 35c

Braziers' Sheets.—30x60, 6 to 8 lbs..₱ ℔ 35c | 30x60, 10 to 100 lbs..₱ ℔ 31c
30x60, 10 & 12 lbs. " 33c

Solder.—F. S. & Co.'s make.

Best Fine	20c
No. 1	18c
Roofing	17c
Braziers' or Spelter Solder	34c to 25c

Antimony..... 17c
Babbit Metal—F. S. & Co.'s..... 16c
No. 2..... 14c

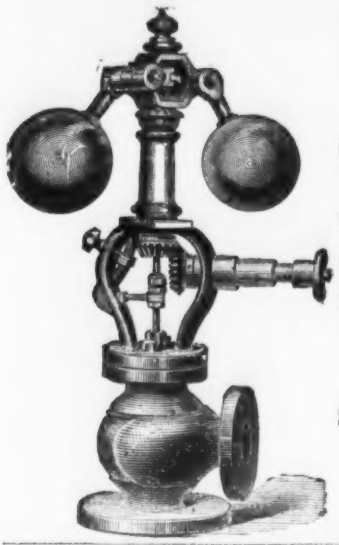
Sheet Iron.—

	Common.	Smooth. Com.	Smooth Charcoal.	Smooth Juniata.
No. 24	4¼c	5¼c	6¾c	8¾c
25 & 26	4¼c	5¾c	7 c	9 c
27	4¾c	6 c	7¾c	9¾c

Galvanized Iron.....dis 30 %

No. 16 to 20	14c	No. 27	15c
21 to 24	13c	28	16c
25 & 26	14c		

Russia Iron.—Perfect..... 13c | No. 1 Stained..... In sheets, 1c. higher.
American Russia.—A..... 11c | B..... 11c
In sheets, 1c higher.
Lead.—Pig..... 7½c | Bar..... 8½c | Lead Pipe, in full coils 8¼c | Lead Pipe, when cut..8¾c | Sheet Lead..... 8¾c
Wire—Bright..... dis 30 %
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TO ALL WHO USE STEAM-POWER!

We will put our Governor on any Engine, and guarantee it to prove itself superior to all others.

If, after a fair trial, it does not, we will take it off at our own expense.

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SHIVE'S PATENT WATCHMAN'S CLOCK AND DETECTOR.

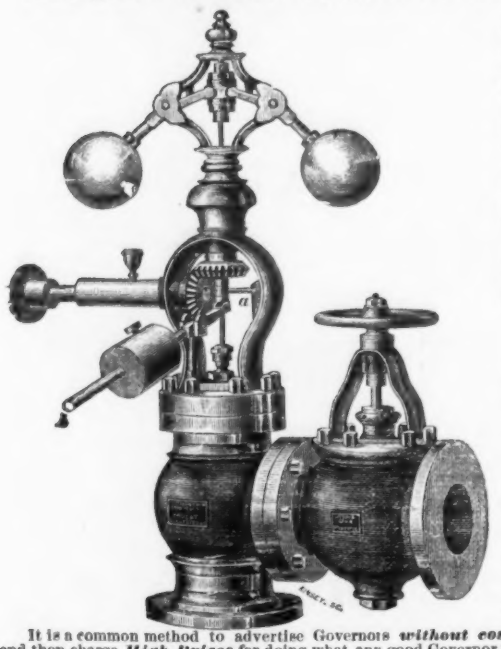
The Best and Cheapest Watcher of the Watchman made

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Circulars sent free

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☞ When Governors are ordered, be particular and say Governor with Stop Valve, or without Stop Valve; and either Black, Finished or Portable, as you may require, and with or without Lever Attachment.

For dimensions and other particulars send for Illustrated List.

Capacity of Valve or Diameter of Steam Pipe in inches.	Price, Black.	Price, Bright Finish.	Price, Portable.	Price of Lever Attachment for altering speed.	Price of Stop Valve.
½	18·00	20·00	17·00	..	..
¾	20·00	22·00	19·00	..	..
1	24·00	27·00	22·00	2·00	5·25
1¼	29·00	32·00	27·00	2·25	6·64
1½	34·00	38·00	31·00	2·50	8·50
2	41·00	46·00	38·00	2·75	11·50
2¼	47·00	54·00	..	3·25	16·00
2½	50·00	57·00	47·00	3·50	17·00
2¾	55·00	62·00	No Larger Portable made than 2½ in.	3·75	19·00
3	62·00	70·00		4·25	22·00
3½	71·00	80·00		4·50	27·00
4	81·00	92·00		5·00	32·00
4½	91·00	103·00		5·50	37·00
5	102·00	114·00		6·00	42·00
5½	116·00	129·00		6·50	48·00
6	134·00	148·00		7·00	55·00
7	160·00	176·00		8·00	69·00
8	199·00	219·00		9·00	83·00
9	230·00	255·00		10·00	..

No Charge for Boxing & Cartage.

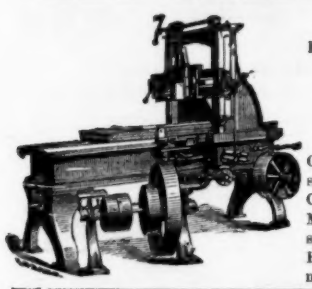
It is a common method to advertise Governors ***without cost***, unless satisfactory to the customer, and then charge ***High Prices*** for doing what any good Governor will do. Various Governors inferior to the "Judson" are sold in this way, operating well enough for three months, to insure collection of the pay, but becoming useless after a year's wear—their construction lacking durability. The Judson Governor is guaranteed to be not only the best Regulator of Steam Engines, but also the most durable Governor made. Parties in buying other Governors should stipulate that their durability be guaranteed, and should also take care that they do not, for much inferior Governors, pay higher prices than those shown in the above list. We guarantee the Judson Governor will do all any other Governor can do, and in Accuracy and Durability—the main essentials—we guarantee it shall do more.

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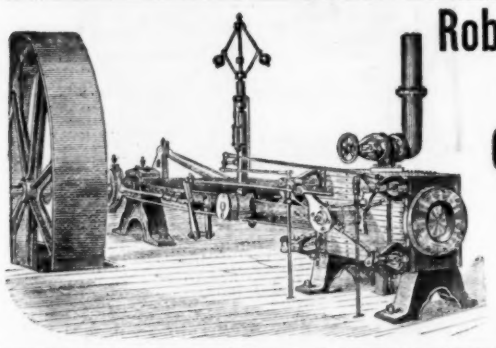
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Drop Hammers

Of recently Improved Construction. Pony Trip Hammers, Blacksmiths' Sheaves, Broaching and Stamping Presses, Iron Shop Cranes, Machinists' Tools, Gun and Sewing Machine Machinery. Make to order Gray and Charcoal Iron Castings of all styles and sizes not exceeding 15 tons weight, (making patterns if desired). Furnish Clamp Pulleys of light patterns, cut gears in a superior manner, &c., &c.



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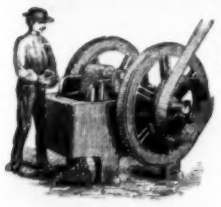
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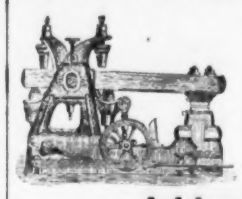
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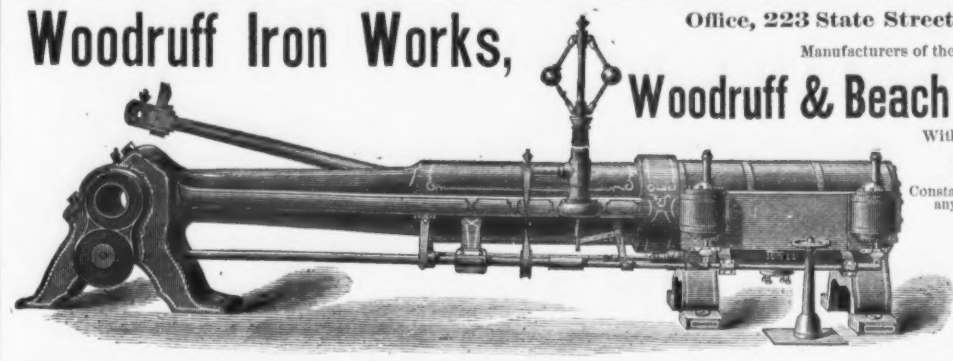
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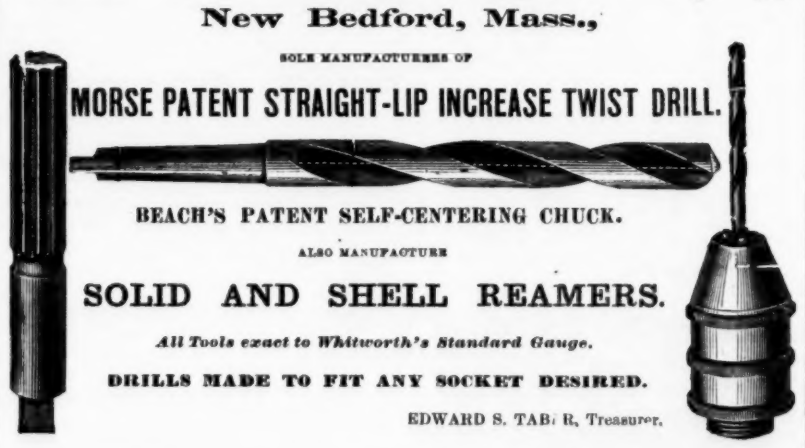
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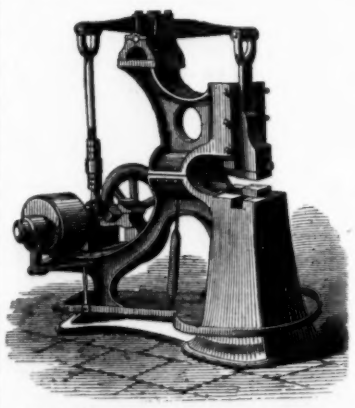
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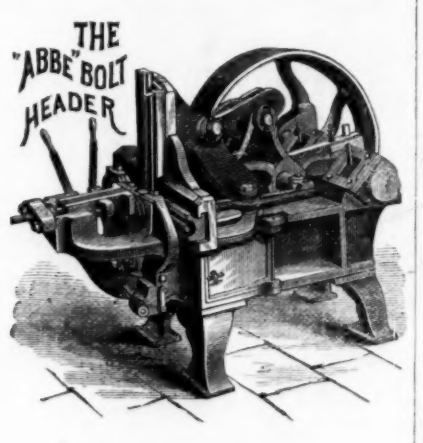
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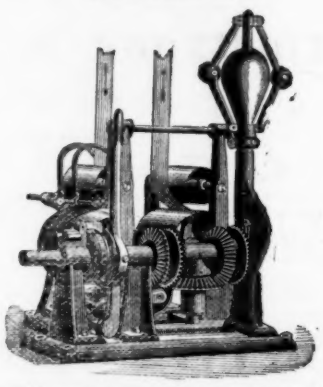
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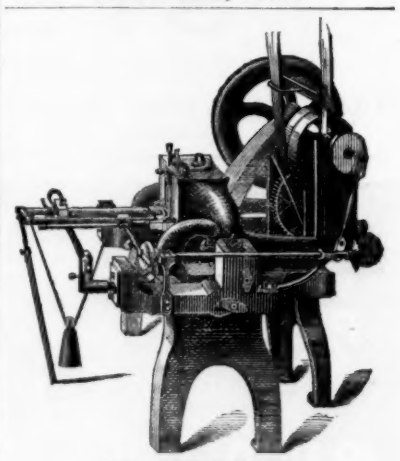
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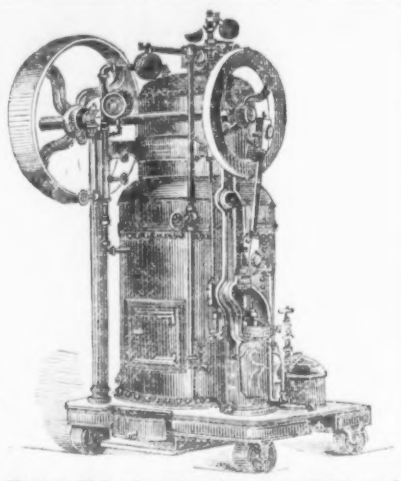
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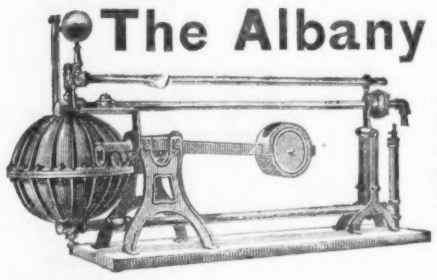
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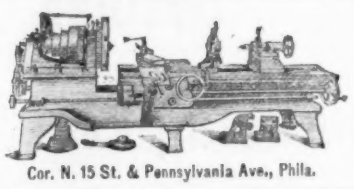
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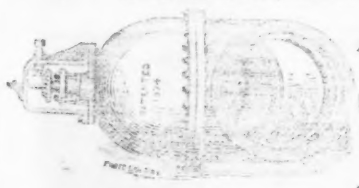
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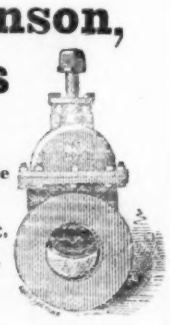
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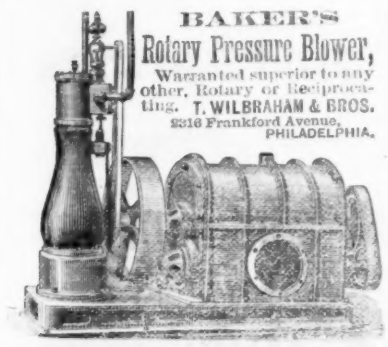
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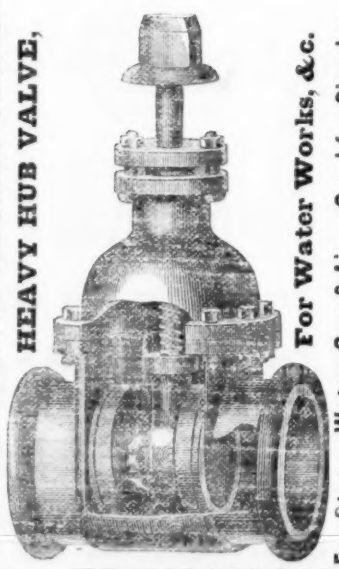
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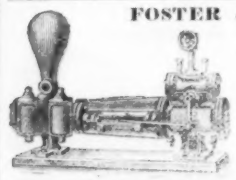
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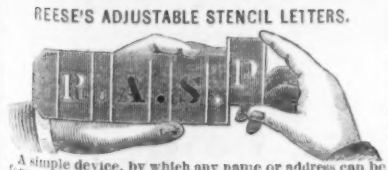
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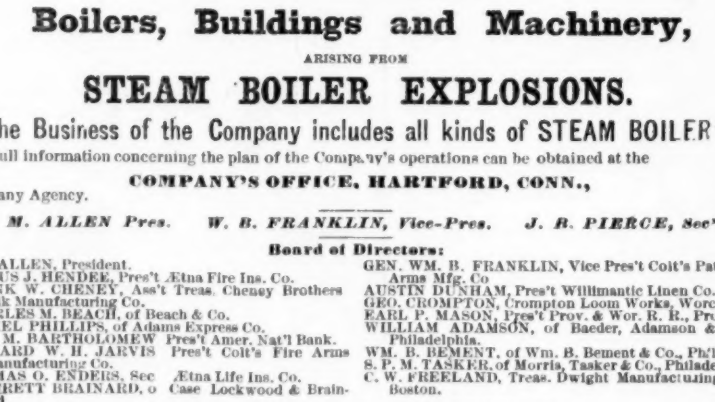
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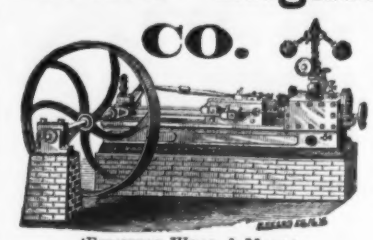
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The best and Most Complete Assortment in the Market.

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We keep constantly in process large numbers of Engines, which we furnish at the very lowest prices and on the shortest notice. We build Engines specially adapted to Mines, Saw Mills, Grist Mills, Tanneries, Cotton Gins, Threshers and all classes of manufacturing.

We are now building the celebrated Lane Circular Saw Mill, the best and most complete saw mill ever invented.

We make the manufacture of Saw Mill Outfits a special feature of our business, and can furnish complete on the shortest notice.

Our aim in all cases is to furnish the best machiner in the market, and work absolutely unequalled for design, economy and strength.

Send for Circular and Price List.

UTICA STEAM ENGINE CO.,
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LATHES, PLANERS,

and other

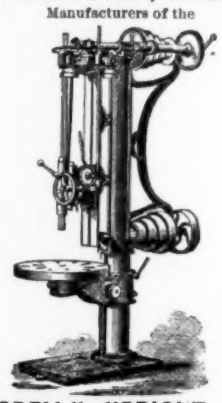
Machinists' Tools.

For Sale by

New Haven Mfg. Co.,

NEW HAVEN, CONN

P. BLAISDELL & CO.,
WORCESTER, MASS,
Manufacturers of the



'BLAISDELL" UPRIGHT DRILLS

And other First-Class Machinists' Tools.



JOHNSON'S PATENT UNIVERSAL LATHE CHUCK.



We invite attention to the superior construction of this chuck. Its working parts are **absolutely protected from dirt and chips.** It is strong, compact and durable, and will hold the greatest variety of work, as the jaws are adjustable with range the full diameter of the chuck. For Price List address,

Lambertville Iron Works, Lambertville, N.

Patented Steam and Hydraulic, April 1, 180



EAGLE PACKING,

Of various sizes for **ENGINES and PUMPS,** manufactured by JAMES GLANDING & CO., No. **115** Queen St., Philadelphia. What the proprietors claim for the Eagle Packing: 1. Its general adaptation to all purposes for which packing is used. 2. Its durability. It will outlast any other article in use. 3. Its cheapness. It can be furnished to the consumer at a lower rate than any other packing

TUBAL SMELTING WORKS,

760 South Broad Street, PHILADELPHIA.

PAUL S. REEVES,

MANUFACTURER OF

ANTI-FRICTION METALS.

XXX Genuine	40c	C	20c
XX	38c	D	15c
X	35c	E	13c
A	30c	F	11c
B	25c		

"Note."—The above are my standard mixtures, and have given satisfaction wherever used, but I am prepared to make Anti-Friction Metal of any quality or mixture desired by the purchaser.

BRASS CASTINGS, 21 to 35c. | INGOT BRASS, 19 to 28c. | BRASS TURNINGS AND OLD METALS WANTED.

Plumb. Burdict & Barnard,

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MANUFACTURERS OF

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SKEIN BOLTS,

CARRIAGE BOLTS,

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Machine and Blank Bolts.

FERNALD & SISE, N. Y. Agents, 100 Chambers St.

ESTABLISHED 1842.

WM. & HARVEY ROWLAND,

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P. O. Address: Frankford, Philad'a. | MANUFACTURERS OF ALL KINDS OF

Elliptic, Platform AND C Springs,

MADE EXCLUSIVELY FROM

SWEDISH STOCK, OIL-TEMPERED and WARRANTED.

Swedish Tire, Toe, Blister and Spring Steel.

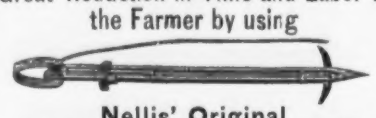
CAST SPRING AND PLOW STEEL.
CAST SHOVEL, HOE AND MACHINERY STEEL.

BESSEMER TOE, SLEIGH AND TIRE STEEL.
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BESSEMER MACHINERY AND CULTIVATOR STEEL.

RE-ROLLED NORWAY SHAPES.
NORWAY NAIL RODS. ROLLED AND SLIT FROM SUPERIOR BRANDS.

NEW TIME TABLE.

Great Reduction in Time and Labor to the Farmer by using



Nellis' Original

HARPOON HORSE HAY FORK,



Nellis' Grapple.

Grapple and Pulleys; also, Nellis' Patent Stacker and Method of conveying Hay, Straw, &c. A ton of Hay can be delivered in three to five minutes to any part of Mow or Stack. The right of Stacker and Conveyer granted FREE to the Farmer purchasing our Horse Hay Fork and Fixtures during season of 1875. With it Pulleys can be attached or detached to rafter or beam, without the use of a ladder.

NELLIS' PULLEY,

Improved Wrought Frame, Prepared Wood Wheel. Warranted superior to any Horse Fork Pulley offered in the market.

A trial of these goods will convince any farmer that he cannot afford to dispense with them, as their entire cost is often times saved by a single day's use.



Also manufacturers of all descriptions

Of Agricultural Steel & Iron,

Steel Tempered by Nellis' process to suit every kind of soil.

Prices and descriptive Catalogues of our goods furnished free. Address,

A. J. NELLIS & CO.,
Pittsburgh, Pa.

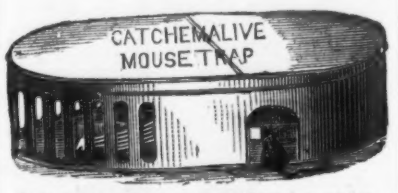
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ESTABLISHED 1840.

R. E. DIETZ,

No. 54 & 56 Fulton, and
29 & 31 Cliff Street, New York,

Manufacturer of the



Each mouse caught resets the Trap for another.

TUBULAR

And Other

Patent Lanterns

BRASS AND IRON

Jack Chains.

STANLEY G. FLAGG & CO.

PHILADELPHIA, PA.
Office and Warehouse,
No. 216 & 218 N. THIRD ST.
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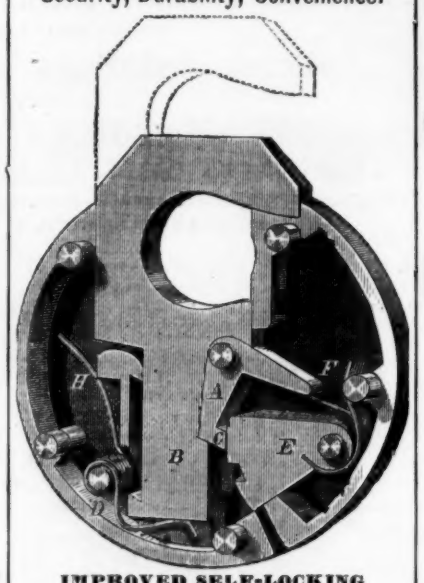
STEEL CASTINGS.

A Substitute for Steel and Wrought Forgings.
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Security, Durability, Convenience.



IMPROVED SELF-LOCKING

Brass Pad Locks.

Made in the most substantial and compact manner, and are in every respect a superior article. We guarantee that no two locks are alike, unless specially ordered. Each lock furnished with two keys. Any number of locks or keys made to order. Adopted by the United States Government. Samples of No. 1 Lock sent to all parts free, on receipt of $1.75. Liberal Discounts to the Trade.

GAS FIXTURES.

Lamps, Bronzes.

Equal to any made, in great variety, all of our own manufacture.

BRADLEY & HUBBARD MFG. CO.,
SALESROOMS:
21 & 23 Barclay, cor. Church St.,
NEW YORK.



SCRANTON

Brass Works,

J. M. EVERHART,

Manufacturer of Brass Work for Water, Gas and Steam. Brass Castings and Jobbing promptly attended to.

SCRANTON, PA.

445 Miles of Pencils.

The Dixon Crucible Company, of Jersey City, received orders during the first week of this month for 28,000 gross, or, 4,032,000, of Dixon's American Graphite Pencils. It is hardly probable that so great a number of pencils was ever before ordered from any single manufacturer in the world in any one week.

Each pencil is seven inches in length, making 2,352,000 feet, or 445 miles, of pencils placed end to end!

To make these will require 83,000 feet of cedar lumber—an entire cargo from Tampa Bay, Florida. where a saw mill is run by the company to saw cedar boards for the Dixon pencils. They are packed in cases containing 50 gross each for shipment, requiring 560 cases and six freight cars to start these pencils from the works of the Dixon Company.

Russell, Burdsall & Ward,

PORT CHESTER, N. Y.

Manufacturers of

Carriage, Tire, Plow, Stove

AND OTHER

BOLTS.

Carriage Bolts made from Best Square Iron, a Specialty.

Headquarters for Door Springs.

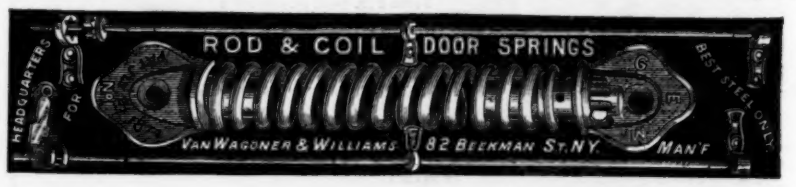
WE MANUFACTURE

All the Leading kinds at lowest cash prices.

We GUARANTEE every one of

The "Gem" Coil Springs

To be of Best Quality of Cast Steel Wire, and Excellent Temper.



OUR



Old Style Rod Springs,

AND



Gray's Improved Rod Springs

Are warranted to be FIRST-CLASS in every respect.

Van Wagoner & Williams,

HARDWARE MANUFACTURERS,

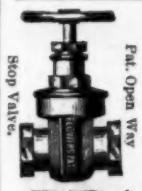
82 Beekman Street, N. Y.

DERBY SILVER CO., Derby, Conn.,

Manufacture the most reliable

SILVER PLATED SPOONS & FORKS.

They are plated by weight, and not by time or guess, containing 20 per cent. more silver than the usual standard, on a base of Nickel Silver, and finished by hand. Each article is guaranteed by the trade mark and warranted to give full satisfaction. We ask of the trade a fair and impartial test, assuring them that the high standard already attained, shall be maintained. Send for Catalogue and Price.





Schofield's Pat. Gauge Cock.

HENRY C. MEYER & CO.,
Manufacturers of

BRASS WORK

For Water, Gas and Steam.

Importers and Dealers in PLUMBERS' MATERIALS,
46 & 48 Cliff Street, N. Y.

Specialties manufactured and controlled by us: Fuller's Patent Faucets and Mineral Water Cocks; Mundbek Hydrants and Street Washers; Flower's Open Way Valves; Schofield's Gauge Cocks; Hall's Leak Gas Cocks. Illustrated Catalogues expressed to the trade on application, where this advertisement is referred to.



The Most Durable for Hot or Cold Water ever made.